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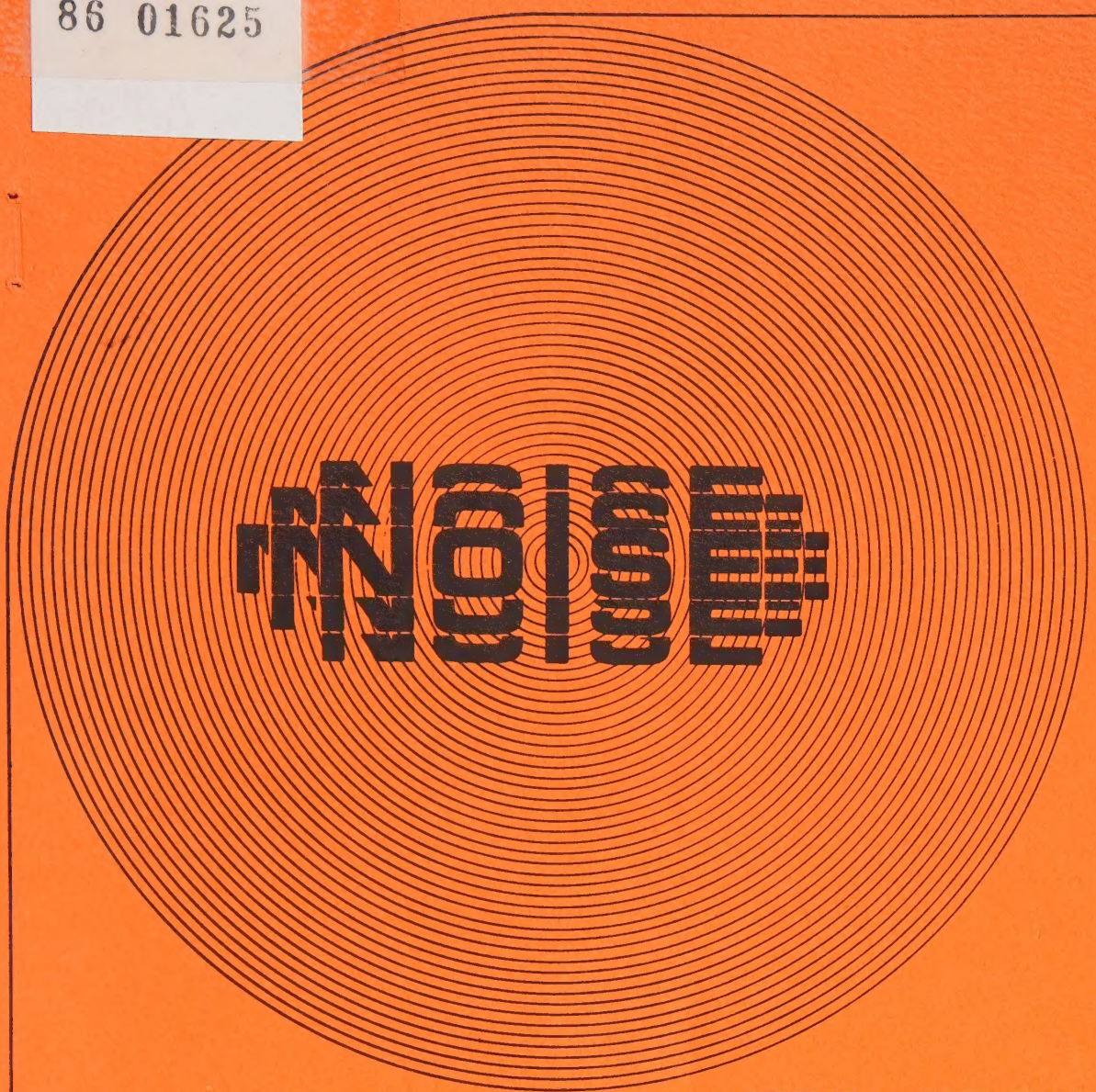

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ELEMENT

YUBA CITY/ SUTTER COUNTY GENERAL PLAN

86 01625

Approved by the Yuba City Planning Commission
February 27, 1979 - Resolution No. 79-01

Adopted by the City Council of the City of Yuba
City - April 16, 1979 - Resolution No. 5903

Approved by the Sutter County Planning Commission
May 15, 1979 - Resolution No. 79-06

Adopted by the Board of Supervisors of the County
of Sutter - June 12, 1979 - Resolution No. 70-113

COUNTY OF SUTTER/CITY OF YUBA CITY

NOVEMBER, 1978

BOARD OF SUPERVISORS

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Robert Schroeder, Planning Draftsman
Brian Trudgeon - Project Staff

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G E N E R A L

STATE REQUIREMENTS

California Government Code Section 65302(g), as amended by Senate Bill 860 (effective January 1, 1976), requires the County to prepare a Noise Element of the General Plan which:

"...shall recognize guidelines adopted by the Office of Noise Control pursuant to Section 46050.1 of the Health and Safety Code, and which quantifies the community noise environment in terms of noise contours for both near and long-term levels of growth and traffic activity. Such noise exposure information shall become a guideline for use in development of the land use element to achieve noise compatible land use and also to provide baseline levels and noise source identification for local noise ordinance enforcement."

Section 65302 (g) also states that the adopted Noise Element shall:

"...become the guidelines for determining compliance with the State's Noise Insulation Standards as contained in Section 1092 of Title 25 of the California Administrative Code."

This Noise Element was prepared generally in accordance with Chapter 3, Division 1, Title 7 of the Government Code (1977). The guidelines outline the procedures to be used to conform with California Government Code Section 65302 (g). Noise sources considered by the element but not limited to include highways, railroads, airports, industrial plants, and other stationary sources identified by the local agency contributing to the community noise environment.

The guidelines state noise exposure information shall be presented in terms of noise contours expressed in community noise equivalent level (CNEL) or day-night average level. CNEL means the average equivalent A-weighted sound level during a 24 hour day, obtained after addition of 5 decibels to sound levels in the evening from 7 p.m. to 10 p.m. and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m. L_{dn} means the average equivalent A-weighted (see page 2) sound level during a 24 hour day, obtained after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.

The contours shall be shown in minimum increments of 5 db and shall continue down to 60 db. Noise exposure should be determined by monitoring in noise sensitive areas. The Noise Element should also identify the numbers of people exposed to various noise levels. The Noise Element should also recommend mitigating measures and solutions to existing and foreseeable noise problems.

Public and private agencies responsible for construction, maintenance, or operation of significant noise source activities shall provide the local agency any specific data relating to current or projected levels of activity and a detailed methodology for the development of noise contours. Finally, the Noise Element must show in what manner it will be integrated with the City or County's zoning plan and tied to the land use and circulation elements and to the local noise ordinance.

PLANNING RELATIONSHIPS

The Noise Element is a "source" document to be used in formulating policies for other elements of the General Plan, including the Land Use Element and the Circulation Element. The Noise Element also contains policies regarding noise and noise abatement which will influence other public policy documents relating to the location of public facilities, health and safety standards, construction standards and community noise ordinances.

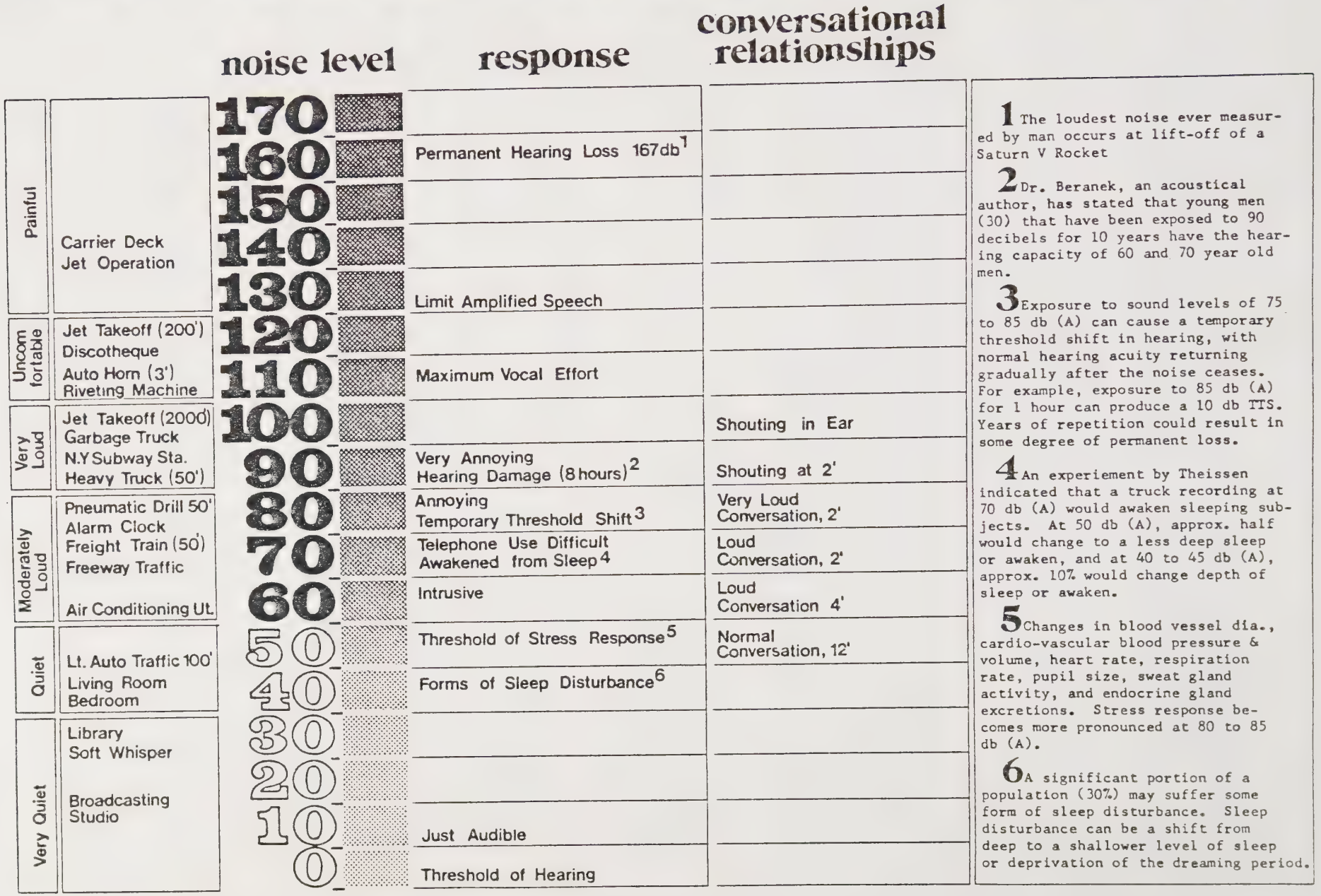
HOW NOISE IS MEASURED

The ambient noise of the community is all environmental noise, which is usually a composite of sound from many sources near and far. The noise of individual events, such as a passing car or train, an aircraft flying overhead or a lawn mower in the neighborhood, are superimposed on this composite of sound.

The human ear can hear frequencies from 20 to 20,000 H_z; although it does not hear them all equally well. In measuring sound frequency, the most widely used decibel scale is the A-weighted sound pressure level which is measured in A-weighted decibels or dBA. The A-weighted scale covers a frequency range of 400 to 12,000 H_z. Like the ear, it is more sensitive to the higher, rather than the lower frequencies. The measuring unit "decibel" is used to express the relative loudness of sound. Each time the intensity of a sound is doubled, there is an increase of 3 decibels; and each time the intensity is multiplied by 10, there is an increase of 10 decibels. Most people judge each increase of 10 db to be twice as loud.

CNEL and L_{dn} are descriptions of daytime noise levels. They are a weighted average of daytime and nighttime sound levels, with the nighttime noise being weighed more heavily. The figure on the following page shows noise levels compared to human response. Definitions of commonly used noise terms are provided in the Glossary of Terms.

TYPICAL NOISE LEVELS



1 The loudest noise ever measured by man occurs at lift-off of a Saturn V Rocket

2 Dr. Beranek, an acoustical author, has stated that young men (30) that have been exposed to 90 decibels for 10 years have the hearing capacity of 60 and 70 year old men.

3 Exposure to sound levels of 75 to 85 db (A) can cause a temporary threshold shift in hearing, with normal hearing acuity returning gradually after the noise ceases. For example, exposure to 85 db (A) for 1 hour can produce a 10 db TTS. Years of repetition could result in some degree of permanent loss.

4 An experiement by Theissen indicated that a truck recording at 70 db (A) would awaken sleeping subjects. At 50 db (A), approx. half would change to a less deep sleep or awaken, and at 40 to 45 db (A), approx. 10% would change depth of sleep or awaken.

5 Changes in blood vessel dia., cardio-vascular blood pressure & volume, heart rate, respiration rate, pupil size, sweat gland activity, and endocrine gland excretions. Stress response becomes more pronounced at 80 to 85 db (A).

6 A significant portion of a population (30%) may suffer some form of sleep disturbance. Sleep disturbance can be a shift from deep to a shallower level of sleep or deprivation of the dreaming period.

Source: Yolo County Noise Element

ATTENUATION

Attenuation is the reducing of noise to acceptable levels. The degree of difficulty of providing levels of attenuation are shown in the following scale of difficulty:

Barrier Attenuation	
5 dBA	Simple
10 dBA	Attainable
15 dBA	Very Difficult
20 dBA	Nearly Impossible

As may be expected, barriers have been designed to provide attenuation over the range of 5 to 15 dBA. Unfortunately, it has been impossible to determine whether attenuation attributed to barriers are due entirely to them or whether such factors as distance have been included. About 20 percent of the barriers for which attenuation is reported show effectiveness of less than 5 dBA. The average predicted attenuation is about 9 dBA,and the median is about 10 dBA.

At the present there has not been sufficient correlation between predicted and measured attenuation to make an inclusive determination as to the predicability of barrier effectiveness. Variations, both above and below predicted attenuations, have been reported, although barriers are generally not as effective as expected.

It has been shown there is considerable reduction in barrier effectiveness where traffic lanes are visible for even a short distance beyond the barrier. The attenuation of highway noises is only achieved when the sight of the observer and the source are intercepted. Several low barriers have been constructed throughout the State to reduce the noise of automobile and truck tires and engines but are ineffective in reducing truck noise from high vertical exhaust systems. It has been shown that low barriers have been able to attain desired noise levels, however, by taking out the noise close to the ground,the truck exhaust systems are made that much more identifiable. The truck noise may thereby become more objectionable than before the barrier was constructed. It may be simpler to design highway barriers, or at least design the low ones, so that extensions could be added to reduce the noise of high vertical truck exhaust systems.[1]

[1] Highway Noise, U. S. Department of Transportation, Federal Highway Administration, Implement Package 76-8

Noise reduction is a major factor in conventional construction. For example, a dwelling unit with some windows open should still reduce the noise of an exterior source by approximately 15 dB. The same dwelling with all windows closed and air conditioning on, exterior noise should be reduced by 20 dB.

Thus, conventional construction will generally suffice in noise exposure zones up to and equal to L_{dn} 65 dB. In situations where the indicated noise exposure is above 65 dB, and higher levels of noise reduction are called for, the builder has two options:

a. Provide additional insulation called for, or

b. Have a qualified acoustical consultant reassess the site noise exposure through adequate noise monitoring to substantiate an actual lower existing noise environment, and hence justify lower noise insulation requirements.[2]

State law requires interior L_{dn} levels from an exterior source must not exceed 45 dB in a residence with windows and doors closed.[3]

[2] Estimate of Community Noise Exposure in Terms of Day-Night Average Level Noise Contours, Jack W. Swing, Office of Noise Control, May, 1975

[3] California Administration Code, Section 1092 of Title 25 (e)(2) (see Page 55)


5050

G O A L S A N D O B J E C T I V E S

GOALS

1. To preserve and enhance the quality of life for the residents of Sutter County and the Cities of Live Oak and Yuba City.

2. To guard the health and safety of the County's inhabitants.

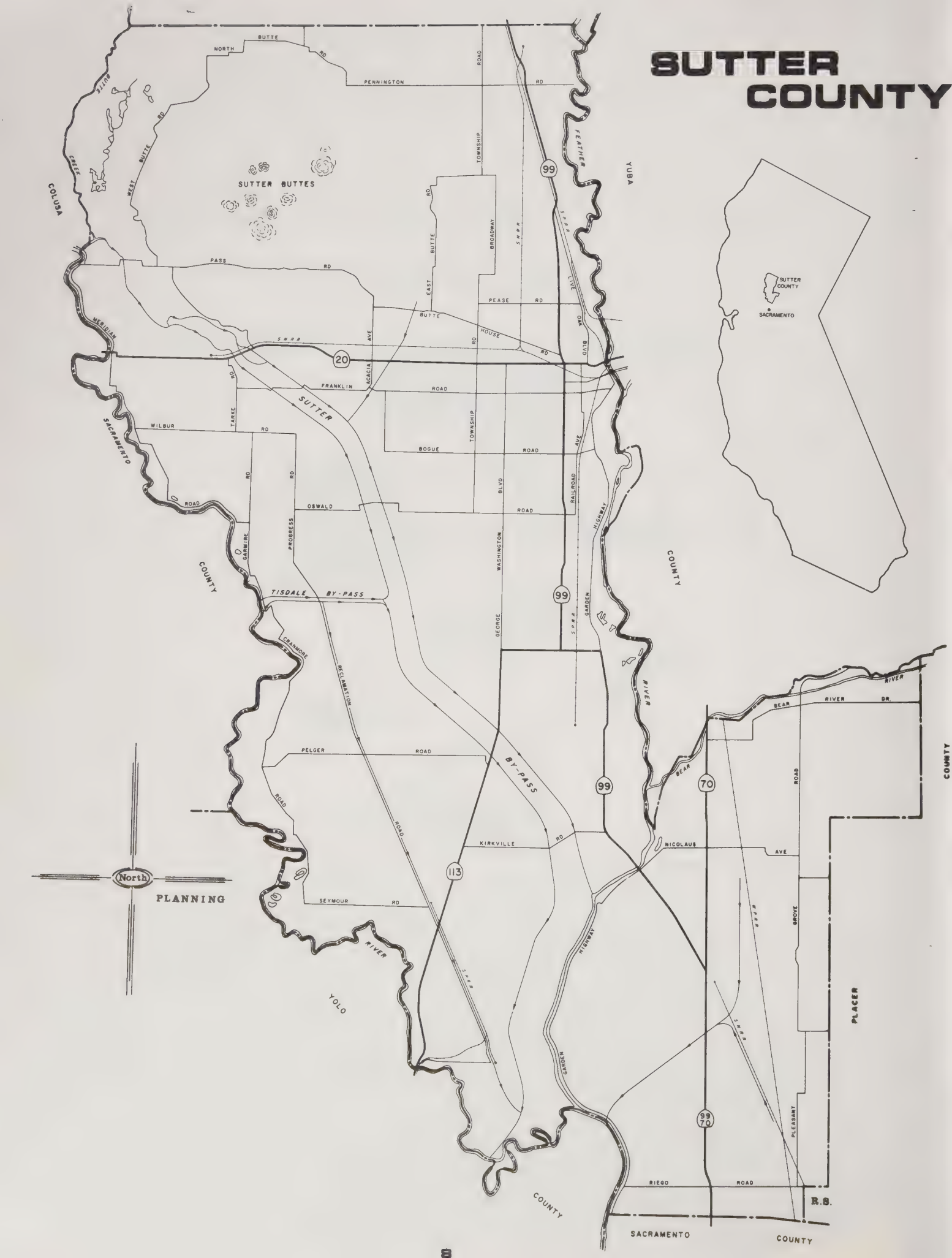
3. To provide indoor noise environments that allow undisturbed conversation, sleep, work, relaxation and privacy.

OBJECTIVES

1. To identify existing noise sources and noise conflicts between uses and/or people.

2. To propose resolution of noise conflicts through attenuation, elimination and alteration of conditions.

3. To propose standards to avoid future conflicts.


SUTTER COUNTY
SUTTER BUTTES
SUTTER COUNTY
SACRAMENTO
COLUSA
YUBA
PLACER
YOLO
SACRAMENTO COUNTY
BUTTE
NORTH BUTTE RD
PENNINGTON RD
WEST BUTTE RD
BUTTE CREEK
PASS RD
EAST BUTTE RD
PEASE RD
HOUSE RD
FRANKLIN ROAD
WILBUR RD
BOGUE ROAD
OSWALD ROAD
TISDALE BY-PASS
PELGER ROAD
KIRKVILLE RD
SEYMOUR RD
NICOLAUS AVE
RIEGO ROAD
BEAR RIVER DR.
SUTTER
SACRAMENTO
FEATHER RIVER
LIVE OAK BLVD
BROADWAY
TOWNSHIP
ACACIA AVE
TARKE RD
GARMIRE RD
PROGRESS RD
GRANMORE RD
RECLAMATION ROAD
WASHINGTON BLVD
GEORGE RD
RAILROAD AVE
GARDEN HIGHWAY
BY-PASS
BEAR RIVER
GROVE ROAD
PLEASANT GROVE
S.P.R.R.
20
99
70
113
R.S.
North
PLANNING

NOISE SURVEY METHODOLOGY

EXISTING CONDITIONS

Sutter County, with a land area of 607 square miles, is located in the Sacramento Valley, approximately 40 miles north of the State Capitol at Sacramento. Two incorporated cities--Yuba City and Live Oak--lie within its boundaries. There are several other small communities scattered throughout the County. The populations of these agricultural communities are listed below based on the 1975 County Special Census:

Community	Population
East Nicolaus	183
Live Oak	2710
Meridian	317
Nicolaus	74
Robbins	227
Sutter	2065
Yuba City	15160
Yuba City fringe/Tierra Buena	8999
Total Unincorporated	28133
Total County	46003

Sutter County is largely composed of rural areas,and many of its residents have enjoyed a relatively peaceful environment most of their lives. The population in Sutter County in recent years has been rising, bringing with it the noise of urbanization. Consequently, areas that were quiet and peaceful are becoming relatively busy and noisy.

NOISE SOURCES

The dominant noise source in Sutter County is automobile and truck traffic. There are four State highways that cross the County; State Routes 20, 70, 99 and 113. Garden Highway runs along the Feather River between Sacramento and Yuba City as another major traffic carrier.

The two incorporated cities of Yuba City and Live Oak also have major streets that,because of vehicular use, are noise sources. Live Oak's major streets are Broadway, Pennington Road and Larkin Road. The major streets in the Yuba City area are Gray Avenue, B Street, Queens Avenue, Plumas Street, Market Street, Clark Avenue, Bridge Street, Live Oak Blvd., Butte House Road, Franklin Avenue, Walton Avenue, Sutter Street and Second Street. All of the above streets in the Yuba City area have ADT's (average daily traffic) of 5000 or more. Some, as shown in Figure 1 , carry two to three times

that amount of traffic daily. Another ground transportation system that has been identified as a noise source is the railroad. In our County we have two companies operating--the Southern Pacific Transportation Company, whose track enters the County just north of Yuba City and proceeds north through the middle of Live Oak and on into Butte County; and the Western Pacific/ Sacramento Northern Railway Company with track in the northern and southern parts of the County, plus a flat switcher yard in the heart of Yuba City. These companies move freight--mostly the perishable orchard and ground crops grown in the County.

Still another form of transportation quite readily identifed as a noise source are airports and the landings and take-offs of the planes associated with them. Sutter County operates two airports--one southeast of Yuba City (Sutter County Airport) and a small one north of Riego Road at the southern end of the County. In addition to these publicly owned airports, there are several private landing strips throughout the County owned by farmers and crop dusting firms. These private landing strips include Sweeter Airport, Bowles Airport, Sanborn Airport, Lampson Airport and Moroni Airport. There is one private heliport just north of Yuba City owned by Nevis Industries.

We are also under the influence of three other airports not located in the County, but their effect is felt due to their proximity. The nearest of these is Yuba County Airport, which currently has approximately twice the operations as Sutter County Airport. The second, also located in Yuba County, is Beale Air Force Base--a vital link in this country's Strategic Air Command defense system. The third--located just south of the County line--is Sacramento Metropolitan Airport whose operations of passenger and freight transportation fly over the southern end of the County 24 hours a day for 365 days of the year.

Other stationary noise sources identified throughout the County include, but are not limited to, canneries, dehydrators, trailer factories, industrial plants, residential-commercial areas, concrete batching plants, quarries, construction sites and agricultural lands.

Transportation noise and stationary noise will be further discussed in the section on Noise Levels for Sutter County with regards to the amount of noise generated by them.

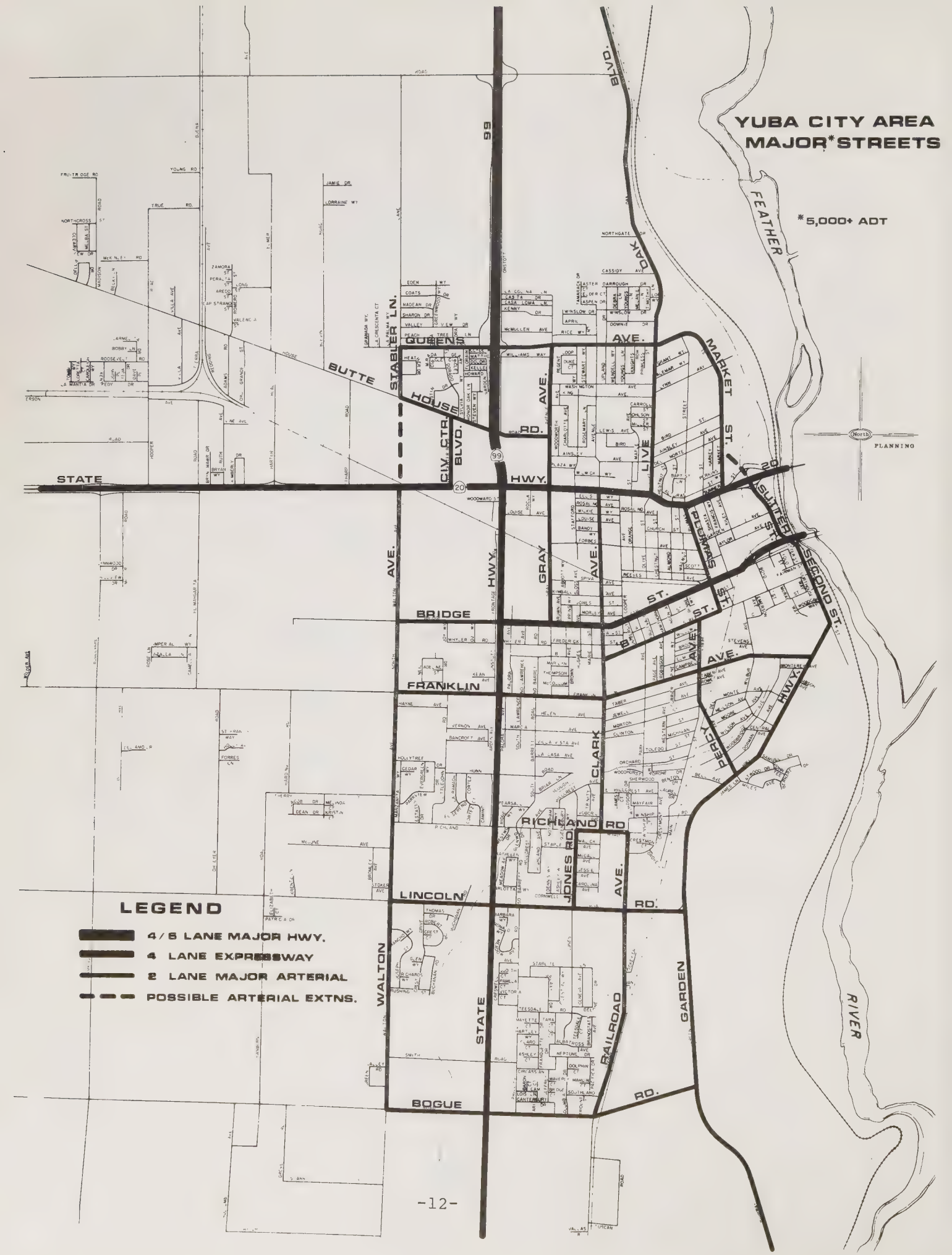
Figure 1

1977 YUBA CITY STREETS ADT 5000+

B Street	between	Cooper and Clark	6092
Bridge Street	between	Park and Hawthorne	12927
Bridge Street	between	Oji and Onstott	5998
Butte House Road	between	Onstott and Gray	5824
Clark Avenue	between	Wilwick and Ainsley	5203
Clark Avenue	between	Taber and Franklin	8464
Clark Avenue	between	Bridge and Morley	9671
Clark Avenue	between	Bridge and A	6859
Franklin Avenue	between	Brown and Clark	8264
Garden Highway	between	Franklin and Second	8245
Gray Avenue	between	Spiva and Kimball	10705
Gray Avenue	between	Bridge and Kimball	10199
Gray Avenue	between	Ainsley and Butte House	11588
Live Oak Blvd	between	Queens and Lorel	8304
Live Oak Blvd	between	Del Norte and Ainsley	13731
Market Street	between	Del Norte and Alturas	5857
Percy Avenue	between	Franklin and B	7395
Plumas Street	between	Colusa and Bridge(northbound)	7461
Second Street	between	Garden Hwy. and C	6986

1977 SUTTER COUNTY ROADS ADT 5000+

Butte House Road	5759
Franklin Avenue, east of State Route 99	6702
Franklin Avenue, west of State Route 99	6483
Garden Highway between B and Franklin	6162
Garden Highway, north of Winship	5568
Garden Highway, south of Winship	5657


YUBA CITY AREA
MAJOR* STREETS
*5,000+ ADT
FEATHER
RIVER
99
BLVD.
OAK
QUEENS
AVE.
STABLER LN.
BUTTE
HOUSE
CIV. CTR.
BLVD.
RD.
99
HWY.
STATE
20
MARKET ST.
LIVE OAK
PLUMAS
SUTTER
ST.
SECOND ST.
ST.
BRIDGE
GRAY
AVE.
HWY.
FRANKLIN
B
AVE.
PEACH
HWY.
CLARK
RICHLAND
RD.
JONES RD.
AVE.
LINCOLN
RD.
WALTON
STATE
RAILROAD
GARDEN
BOGUE
RD.
North
PLANNING
LEGEND
4/6 LANE MAJOR HWY.
4 LANE EXPRESSWAY
2 LANE MAJOR ARTERIAL
POSSIBLE ARTERIAL EXTNS.

NOISE SOURCES - SUTTER COUNTY

1. Highways/Freeways - Routes 20, 99, 70, 113 and Garden Highway.

   Major Streets

   Yuba City - Gray Avenue, Queens Avenue, Plumas Street, Market Street, Clark Avenue, Bridge Street, Live Oak Blvd., Butte House Road, Franklin Avenue, Walton Avenue, Second Street

   Live Oak - Pennington Road (18th Street) and Larkin Road.

   Sutter - Acacia Avenue and Butte House Road.

2. Railways and Rail Yards - Southern Pacific Transportation Co. and Western Pacific/Sacramento Northern Railway Company and Yard.

3. Airports - Sutter County Airport, Riego Flight Strip, private landing strips, Nevis Heliport. Influenced by Beale AFB, Sacramento Metro, Yuba County Airport. Cropdusters - Sweetser Airport, Bowles Airport, Sanborn Airport, Lampsons Airport and Moroni Airport.

4. Stationary Sources - Canneries, dehydrators, construction sites, trailer factories, industrial plants, residential-commercial areas, concrete batching plant, quarries, agricultural land. (See below for specifics)

5. Sensitive Areas - Schools, hospitals, libraries, rest homes, mental health clinic, parks, natural wildlife areas and cemeteries.

SPECIFIC STATIONARY NOISE SOURCES

1. Canneries - Del Monte (Yuba City), Harters (Tierra Buena) and Sunsweet (Yuba City).

2. Dehydrators, Fruit - Howard's and Sunsweet (various locations).

3. Construction Sites - Housing construction (countywide).

4. Trailer Factories - Perris Valley (Yuba City).

5. Industrial Plants - Titan Truss, Sunset Molding, Yuba City Scrap and Steel, Diamond Steel, Tierra Buena Molding Plant.

6. Residential Areas - Subdivisions (people things)

7. Commercial Areas - Bars, Body Shops, Mechanic Shops, ATCO (Associated Transportation Co.), Car Wash.

SPECIFIC STATIONARY NOISE SOURCES CONTINUED

8. Concrete Batching Plants - Mathews Ready Mix, Yuba Ready Mix Concrete Inc., McFarland Ready Mix.

9. Quarries - Butte Rock and Gravel and Butte Base Rock.

10. Agricultural Lands - During cultivation through harvest.

NOISE SENSITIVE AREAS

As stated in the guidelines for the preparation of the Noise Element, sound levels are to be determined by monitoring noise sensitive areas. Below is a list of these areas in Sutter County:

Schools

Yuba City Area - Franklin (Franklin and Township)
Lincoln (Walton and Lincoln)
Barry (State Route 99 and Barry)
Lincrest (Phillips and Teesdale)
7th Day Adventist (Harding)
Tierra Buena (Butte House and Villa)
April Lane (north end of Gray)
King Avenue (Clark and King)
1st Lutheran (Forbes)
Gray Avenue (Gray)
Bridge Street (Plumas and Bridge)
Yuba City High School (B and Clark)
Park Avenue (Park and Morton)
St. Isidore (south end of Clark)

Sutter - Sutter High School (Acacia)
Brittan (Barrow and Pepper)

Live Oak - Live Oak Elementary (Pennington and J)
Luther (Connecticut)
Live Oak High School (Pennington)

Meridian - Meridian Elementary (Central and 5th)

Robbins - Robbins Elementary (Pepper and Santa Cruz)

Pleasant Grove - Pleasant Grove (Howsley)

Nicolaus - Marcum-Illinois (State Route 99 and Nicolaus)

East Nicolaus - East Nicolaus High School (Nicolaus and Pacific)

Rio Oso - Brown (Pacific)

Sutter County - Central Gaither (State Route 113 and Bailey)
Wilson High School (State Route 99 and Wilson)
Encinal (Encinal and Williston)
Nuestro (Nuestro and Broadway)
Winship (Cranmore and Meridian)

Hospitals

Yuba City - Fremont Medical Center, 970 Plumas Street
Sutter County General Hospital, 1965 Live Oak Blvd.
Yuba City Convalescent Hospital, 521 Lorel Way
Yuba Court Senior Care, 1880 Live Oak Blvd.
Sutter County Health Center, Del Norte and Shasta

Mental Health Clinics

Yuba City - Sutter/Yuba Bi-County Mental Health Services, 2290 Forrest Lane

Libraries

Yuba City - Sutter County Library, 750 Forbes Avenue

Live Oak - Barber Branch Library, 10321 Live Oak Blvd.

Sutter - Sutter Branch Library, 2147 California Street

Parks and Wildlife Areas

All parks in incorporated (Yuba City, Live Oak) and unincorporated parts of the County and all natural wildlife areas, such as Sutter National Wildlife Refuge and Gray Lodge State Game Management Area, are considered noise sensitive areas in this Noise Element.

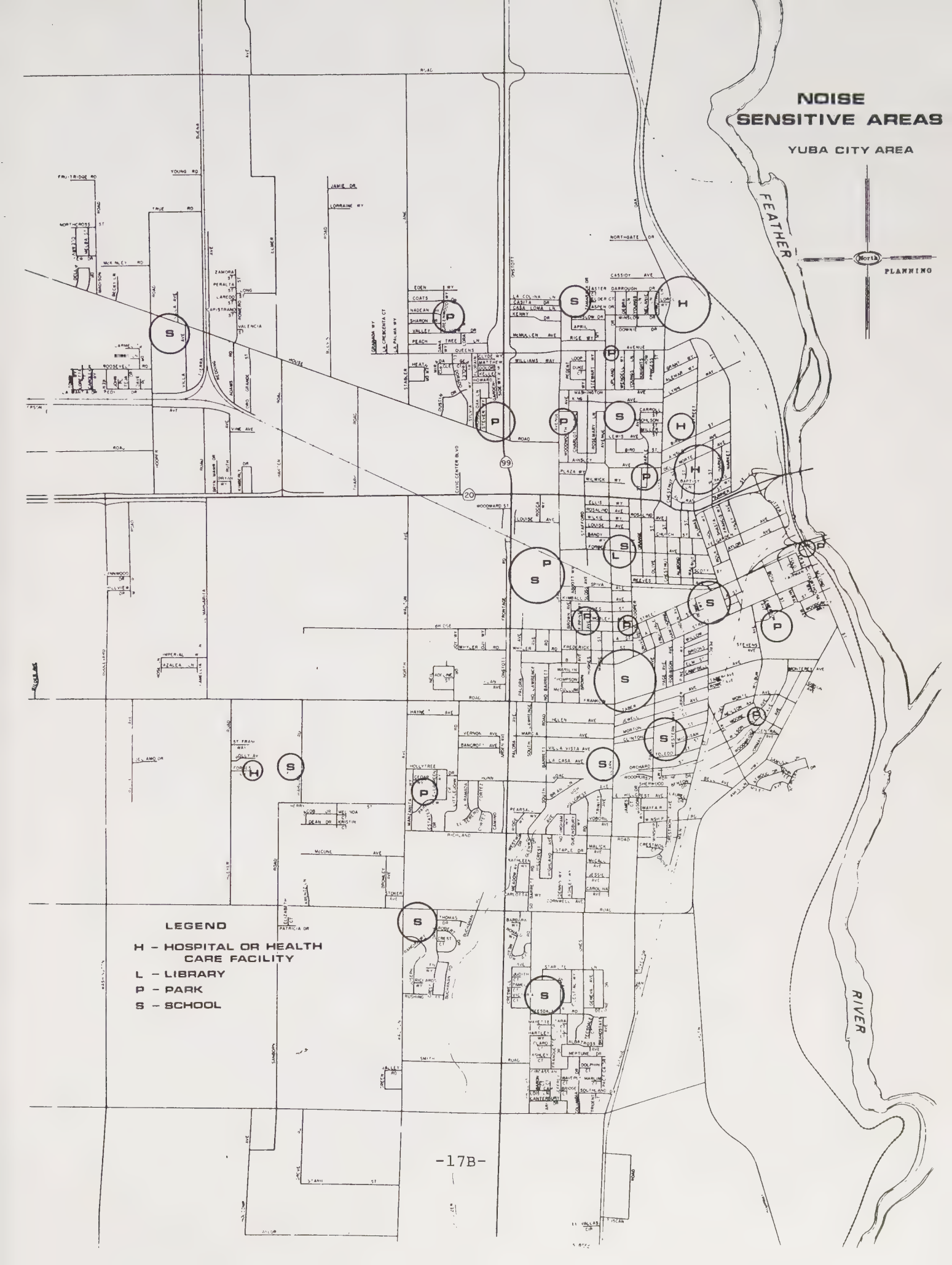
In the following section of this Element are the locations and dB measurements for some of these noise sensitive areas. All measurements were one half hour in length and were taken at random times of the day. All measurement site worksheets are filed with other Noise Element material at the Sutter County Planning Department.

NOISE SENSITIVE AREAS

LEGEND

(S) SCHOOL

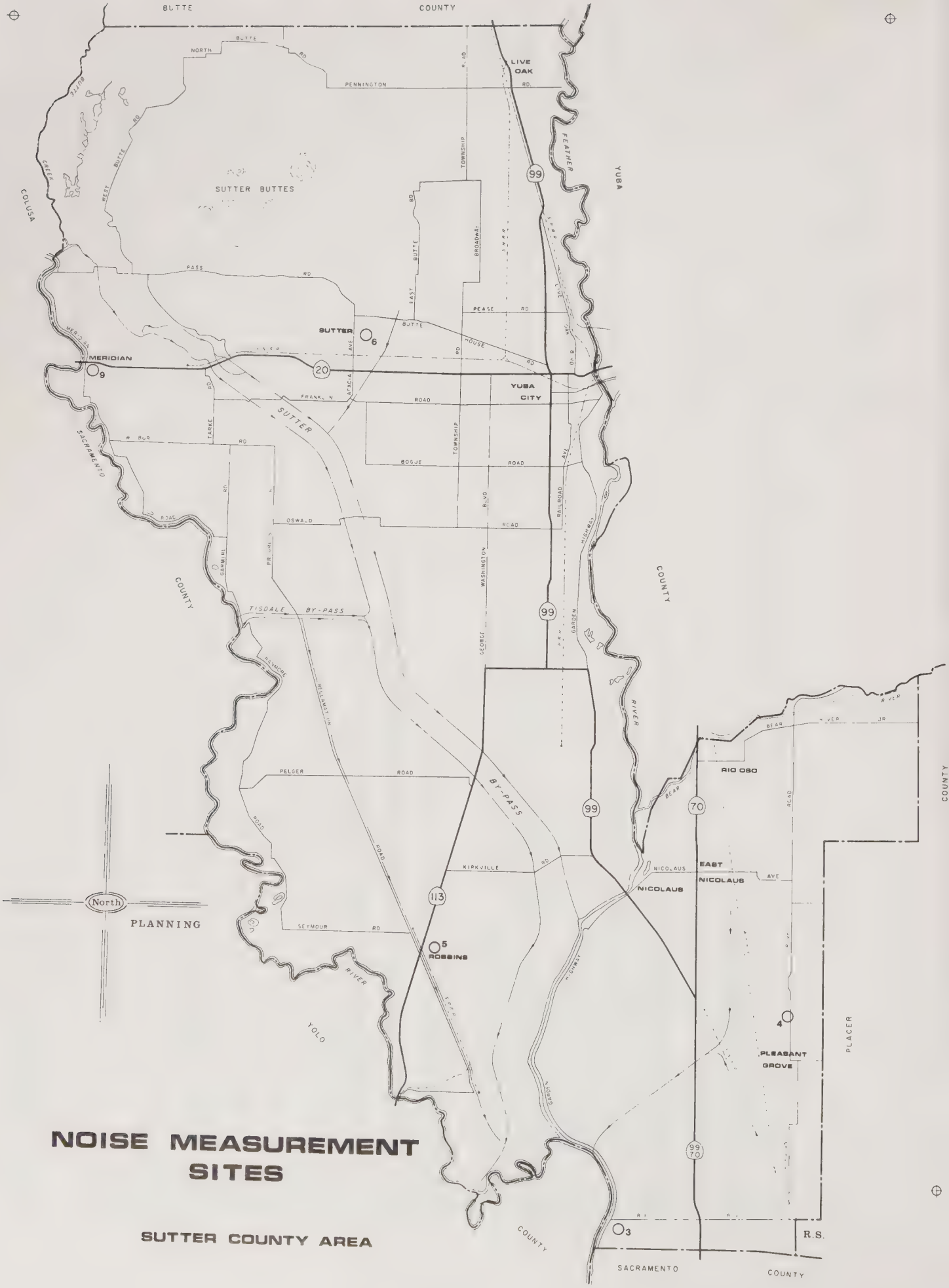
(L) LIBRARY


NOISE
SENSITIVE AREAS
YUBA CITY AREA
FEATHER
RIVER
North
PLANNING
LEGEND
H – HOSPITAL OR HEALTH CARE FACILITY
L – LIBRARY
P – PARK
S – SCHOOL

NOISE MEASUREMENT SITES

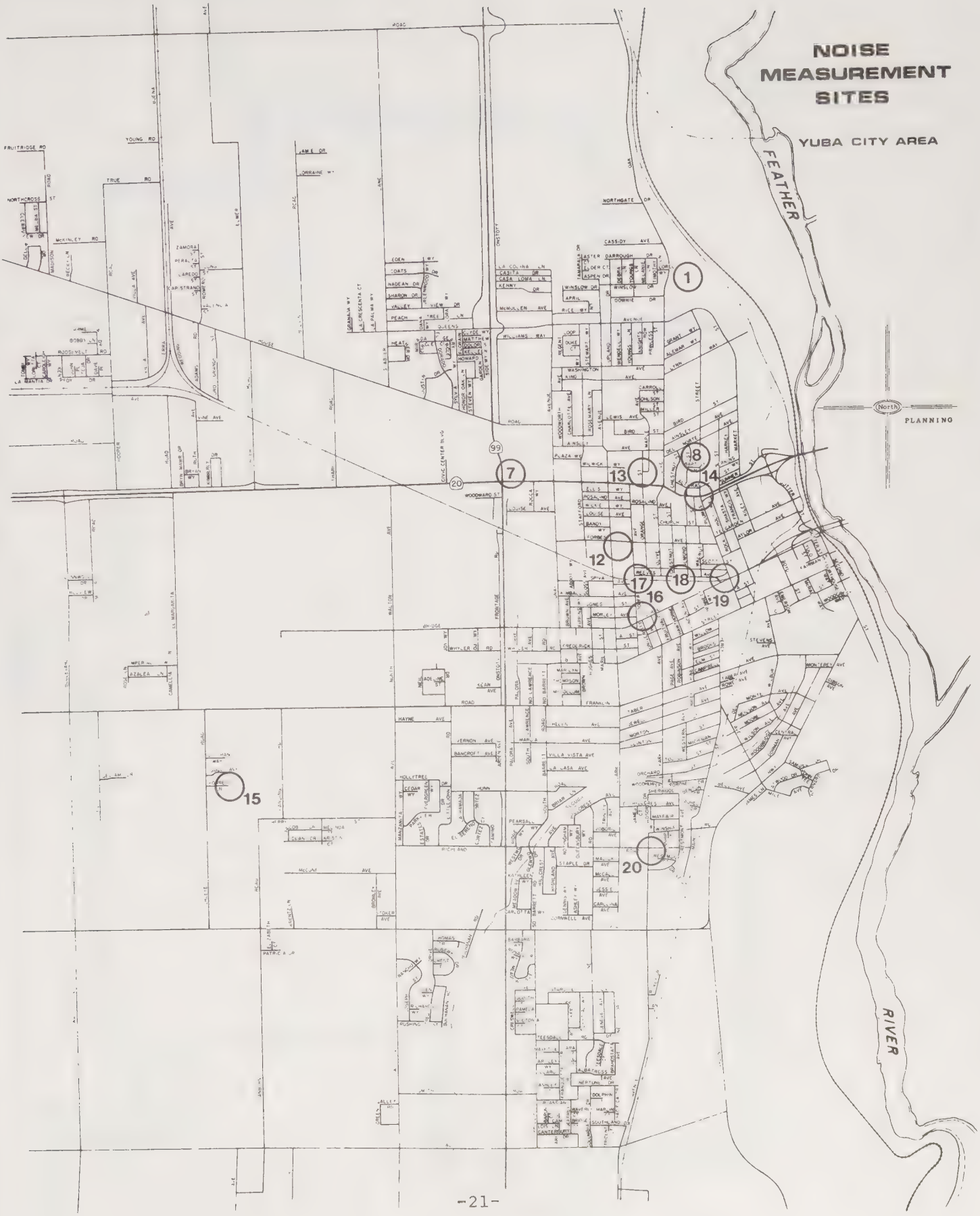
No.	Location	Time Length 1/2hr am	1/2hr pm	Noise Level Ambient	Leq am	Leq pm
1	Sutter County General Hospital, Yuba City	x		47	54	
2	Larkin Road - Sunsweet Test #1, Live Oak	x		72	73	
	Test #2	x		70	75	
	Test #3	x		56	61	
	Test #4	x		58	65	
3	Rio Ramaza (Mobilehome Subdivision)	x		32	62	
4	Southwest corner Pleasant Grove Road/Catlett Road	x		37	57	
5	Robbins Elementary School, Robbins		x	47		62
6	Brittan School, Sutter	x		36	55	
7	Northeast corner State Route 20/State Route 99, Yuba City		x	56		70
8	Fremont Hospital, Yuba City		x	53		62
9	Meridian Elementary School, Meridian	x		43	58	
10	Live Oak High School, Live Oak		x	47		64
11	Southwest corner Pennington Road/Broadway, Live Oak	x		47	79	
12	Sutter County Library, Yuba City	x		44	60	
13	Northeast corner Maple Avenue/Orange Street, Yuba City	x		47	63	

No.	Location	Time Length 1/2hr am	1/2hr pm	Noise Level Ambient	Leq am	Leq pm	
14	Northwest corner State Route 20/Plumas Street, Yuba City	x		57	68		
15	Yuba/Sutter Mental Health Clinic	x		34	52		
16	Northeast corner Bridge Street/Cooper Avenue, Yuba City		x	53		73	
17	Southeast corner Cooper Avenue/Reeves Avenue, Yuba City		x	46		64	
18	Reeves Avenue, southeast of Chestnut Street, Yuba City		x	42		64	
19	Northwest corner Plumas Street/Bridge Street, Yuba City		x	55		67	
20	Backyard, southeast corner Railroad Avenue/Richland Road, Yuba City Test #1		x	38		72	
	Test #2			30	62		
	Test #3		x	40	53		
21	Southeast corner Broadway/Elm Street, Live Oak	x		50	61		



NOISE MEASUREMENT SITES

SUTTER COUNTY AREA


NOISE
MEASUREMENT
SITES
YUBA CITY AREA
FEATHER
RIVER
North
PLANNING
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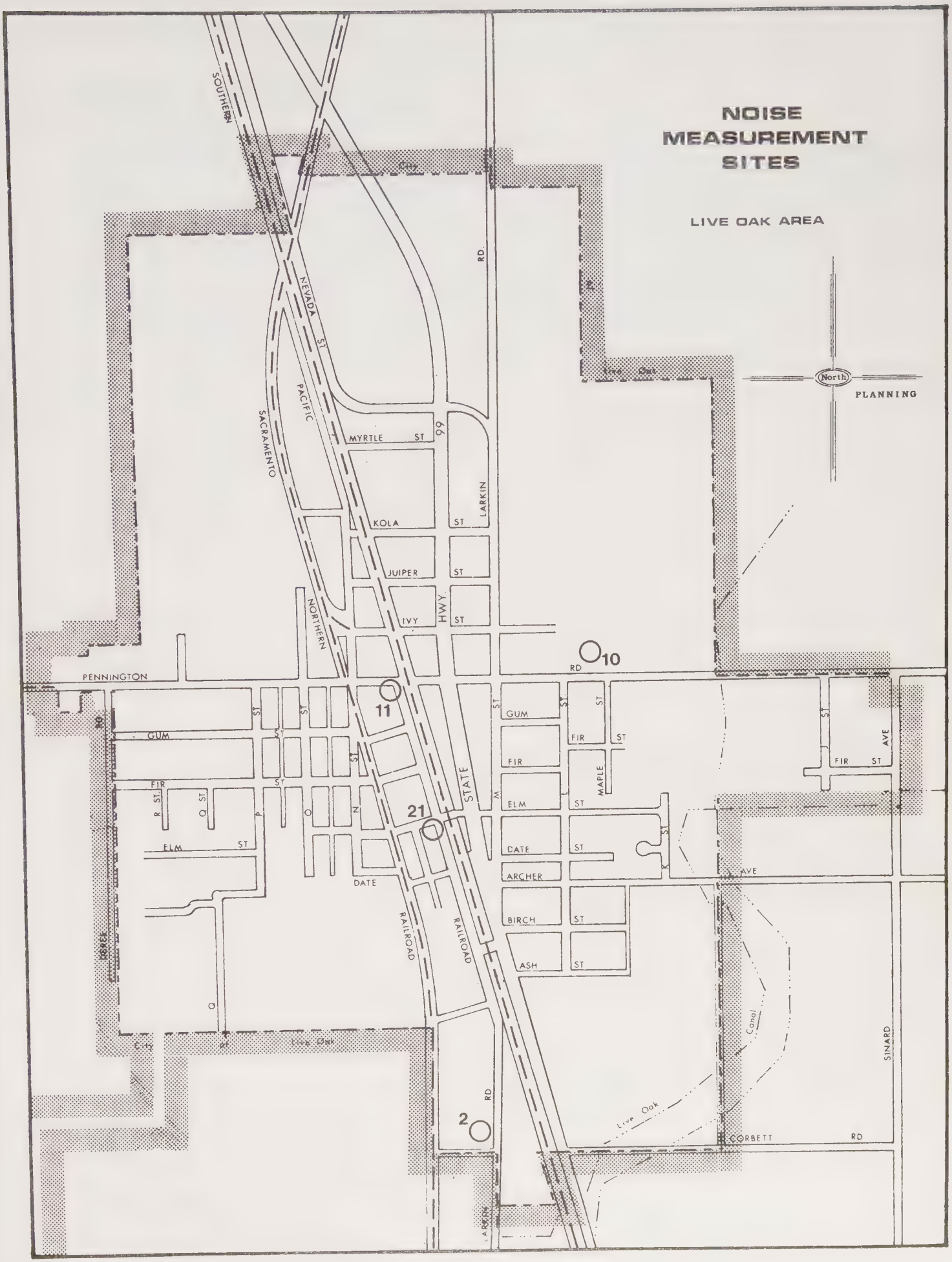
99
20


NOISE
MEASUREMENT
SITES
LIVE OAK AREA
North
PLANNING
SOUTHERN
PACIFIC
NEVADA ST
SACRAMENTO
NORTHERN
HWY 99
LARKIN
RD.
MYRTLE ST
KOLA ST
JUIPER ST
IVY ST
PENNINGTON
RD
10
11
21
2
STATE
GUM
FIR
ELM
DATE
ARCHER
BIRCH
ASH
MAPLE
AVE
RAILROAD
Live Oak
Canal
SINARD
CORBETT RD
LARKIN

NOISE LEVELS FOR SUTTER COUNTY

HIGHWAYS - PRESENT AND FUTURE

Present day contours and projected contours for State Route 20 are presented in the table below. The figures show that the entire length of State Route 20 within the Yuba City limits from sidewalk to sidewalk is approximately 70 dB--and that from 90 feet to 160 feet from the center of the outermost lane, the dB readings would be up to 65 dB. From there out to about 367 feet at maximum, the readings are 60 dB. Within the 65 dB contour, land use is principally commercial, but includes the residences of 44 people. There are 224 persons in the area covered by the 60 dB contour. It is not expected that these population figures will change in the future due to the fact that the area involved is completely developed.

State Route 20	ADT(1977)	70 dB	65 dB	60 dB
Jct. 99/Onstott(w)	15,000	20'	90'	200'
Jct. 99/Onstott(e)	20,700	33'	115'	250'
Live Oak Blvd. (w)	31,000	50'	150'	333'
Live Oak Blvd. (e)	34,000	65'	150'	360'
Plumas Street	29,000	50'	150'	333'
Sutter Street Inter.	34,500	65'	160'	367'

State Route 20	ADT(1995)	70 dB	65 dB	60 dB
Sutter City to Jct.99	19,000	25'	110'	250'
Jct.99 to Live Oak Bl.	35,300	67'	160'	370'
Live Oak Bl. to Bridge	37,600	75'	180'	385'

In the future, according to CALTRANS ADT's (average daily traffic), the amount of traffic carried on State Route 20 will increase a certain degree, but the noise contours will stay much the same, as shown in the table above. For all other State routes (70, 99 and 113) in the County, the ADT's are below 20,000 per day as of 1977. CALTRANS anticipates that only one stretch of State Route 99 from the Sacramento County line to the junction of State Route 70 north will reach an ADT of 20,000 or more (20,900) by the year 1995.

In determining the noise contours for the State routes, the table below was used to adjust the percentage of use by trucks.

Average Percent of Trucks Year Round on State Routes in Sutter County - 1974-75

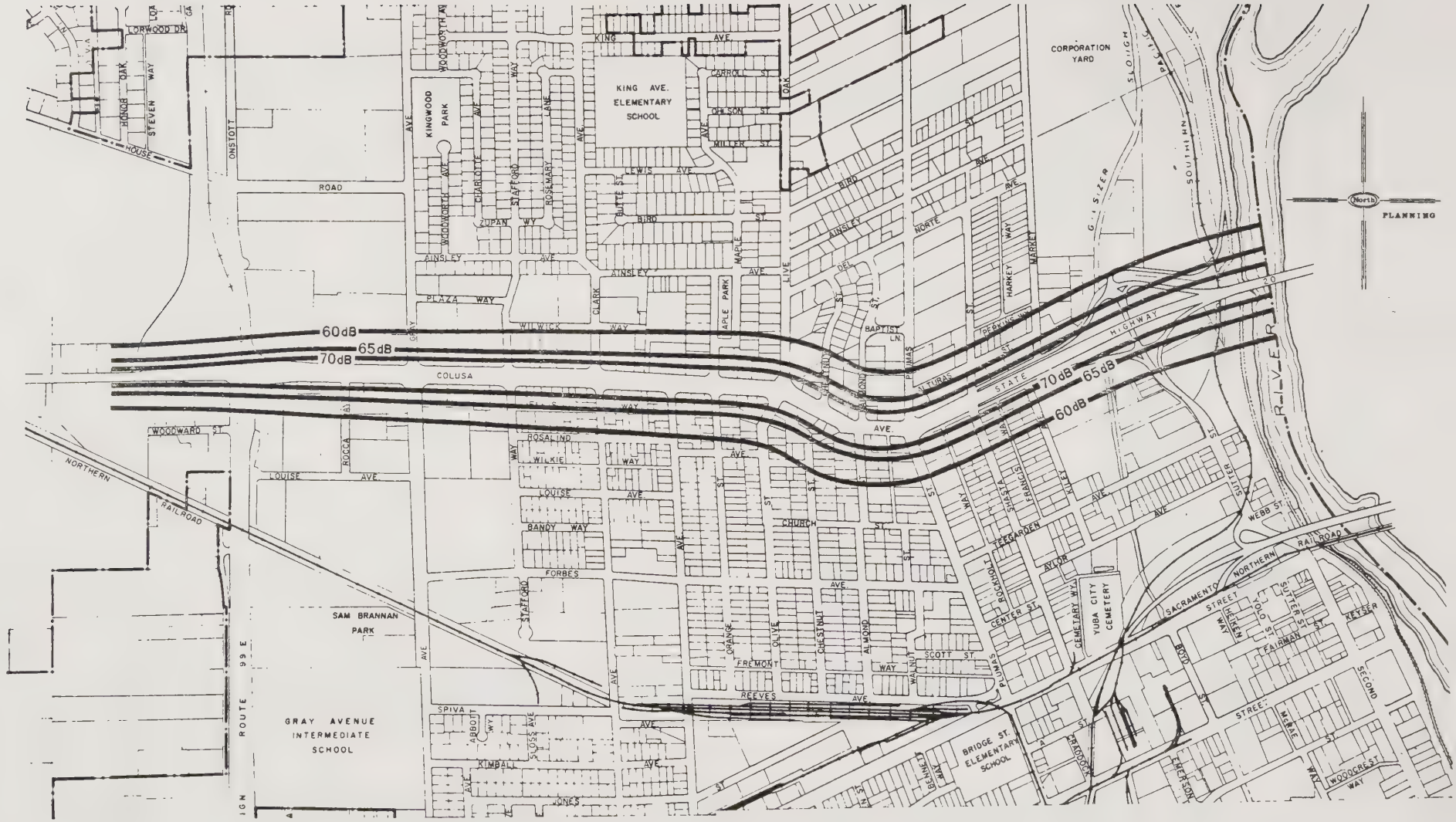
Highway	% Trucks Rural	% Trucks Urban
State Route 20	9	5
State Route 70	10	10
State Route 99 (so. of Yuba City)	11	6
(no. of Yuba City)	10	
State Route 113	9	9

1977 TRAFFIC VOLUMES
Sutter County

Mile Post	Description	ADT Peak Hour	ADT Peak Month	ADT Annual
	Route 20			
0.00	Sutter County Line	300	3100	2700
5.01	East end Sutter Bypass	460	4800	4150
9.18	Acacia Avenue	540	5500	4800
12.67	Township Road	900	9300	8400
13.60	George Washington Blvd.	970	10700	9700
		1500	16500	15000
15.60/	Jct. Rte. 99, Onstott Road	2050	22900	20700
15.57		3100	34500	31000
16.33	Yuba City, Live Oak Blvd.	3400	37000	34000
16.52	Yuba City, Plumas Street	2900	32000	29000
16.84	Yuba City, Sutter Street Interchange	3450	38500	34500
17.06	Sutter County Line	3450	38500	34500
	Route 70			
0.05	Jct. Rte. 99	700	6200	5900
		750	6600	6300
4.00	East Nicolaus, Nicolaus Avenue	810	7400	6800
8.30	Sutter County Line	700	6300	5800
	Route 99			
0.00	Sutter County Line	1250	12300	10300
0.95	Riego Road	1200	11400	9600
		1300	12200	10400
8.14	Jct. Rte. 70 North	540	5100	4400
11.98	Garden Highway (to Nicolaus)	590	5500	4600
19.73	Garden Highway, Tudor, east	530	5100	4300
21.09	Jct. Rte. 113 South, Tudor, west	840	8100	6800
25.62	Oswald Road	930	9000	7500
		920	10900	9200
27.65	Bogue Road	1200	11600	9800
28.67	Lincoln Road	1850	17100	14800
		1950	17300	16000
29.67	Franklin Road	2150	19600	17100
30.03	Yuba City, Bridge Street	1850	15100	14800
30.39	Yuba City, Onstott Road Connect.	2200	18200	17600
30.63	Yuba City, Jct. Route 20			
30.88	Begin Freeway	1050	9400	8600
31.31	Yuba City, Queens Avenue Inter.	840	7600	6900
33.95	Eager Road Interchange	840	7400	6700

Mile Post	Description	ADT Peak Hour	ADT Peak Month	ADT Annual
	Route 99 continued			
35.96	Lomo, Encinal Road, Live Oak Hwy.	1400	12300	11200
40.25	Live Oak, Pennington Road	1250	10600	9700
41.10	Sacramento Northern Railroad Crossing	1000	9300	8100
42.39	Sutter County Line	1000	9300	8100
	Route 113			
0.00	Sutter County Line	620	6600	5000
2.79	Knights Road	590	6200	4800
4.86	Del Monte Avenue	510	5300	4100
		460	4850	3750
10.81	Sutter Causeway	420	4850	3750
		430	4950	3850
14.29	George Washington Blvd.	370	4200	3300
		410	4750	3650
16.21	Jct. Rte. 99 (Break in Route)			

Source: CALTRANS, Traffic Census, Marysville, Ca., District 03



NOISE CONTOURS FOR STATE ROUTE 20

ESTIMATED AVERAGE DAILY TRAFFIC (ADT)
SUTTER COUNTY - 1995

Mile Post	ADT 1977 (Existing)	ADT 1995 (Estimated)
Route 20		
0.0	3850	4400
1.8	2700	3800
9.2	4800	5900
10.7	4800	7700
13.6	15000	19000*
16.3	34000	35300
17.1	34500	37600**
Route 70		
0.0/5.0	7400	9400
8.3	6300	10400
Route 99		
0.0/8.1	10400	20900
13.7	5200	8400
21.1	6800	9000
25.6	7500	11000
30.6	13000 (approx.)	18000
34.9	9000 (approx.)	12200
42.4	8100	14200-12200
Route 113		
0.1/1/1	5000	7300
5.6	4800	6800
9.6	3750	6700
12.1	3300	6400
14.3	3650	11100
16.2	3650	11100

* weighted - average of two intersection counts
** State may have taken into account the fact that a third crossing between Sutter and Yuba Counties has been constructed.

Source: CALTRANS, Traffic Census, Marysville, Ca., District 03

PROPOSED IMPROVEMENTS TO STATE HIGHWAY SYSTEM IN SUTTER BY 1995

Route 99 - from Lomo railroad crossing extending north past the County line from two lane conventional to two lane expressway.

Route 99 - from Junction Route 20 to unspecified point south of town from four lane conventional to four lane expressway.

Route 99 - from Route 99 south of Yuba City to Route 65 south of Marysville. The construction of a two lane expressway and bridge to span the Feather River.

Route 99 - from Junction Route 70 and Route 99 south and extending past County line from two lane conventional to four lane expressway.

Source: Rural Agricultural Goods Movement Study, SRAPC, January, 1977

RAILROADS

Southern Pacific Transportation Company

Southern Pacific has an average of 22 trains that pass through Sutter County per day. Of these 20 are freight trains and 2 are passenger carriers--one northbound and the other southbound. Each of the freight trains has an average length of 4500 feet or 65 cars. During daylight and evening hours (7 a.m. to 10 p.m.), 10 trains pass through, and for the nighttime hours (10 p.m. to 7 a.m.), an average of 12 trains pass through the County. The maximum speed on the main line, which enters the County just north of Yuba City and proceeds north through Live Oak and on out of the County, is 55 mph. They also use the Yuba City branch, which connects Marysville and Yuba City, once a day at a maximum speed of 15 mph.

As shown on the table below, there are approximately 1427 people in the City of Live Oak living in CNEL contours of 60 dB or more.

Ft. from Track	dB Level	Number of People
100	76	49
200	72.5	98
400	66	307
800	62.5	614
1000	58	359

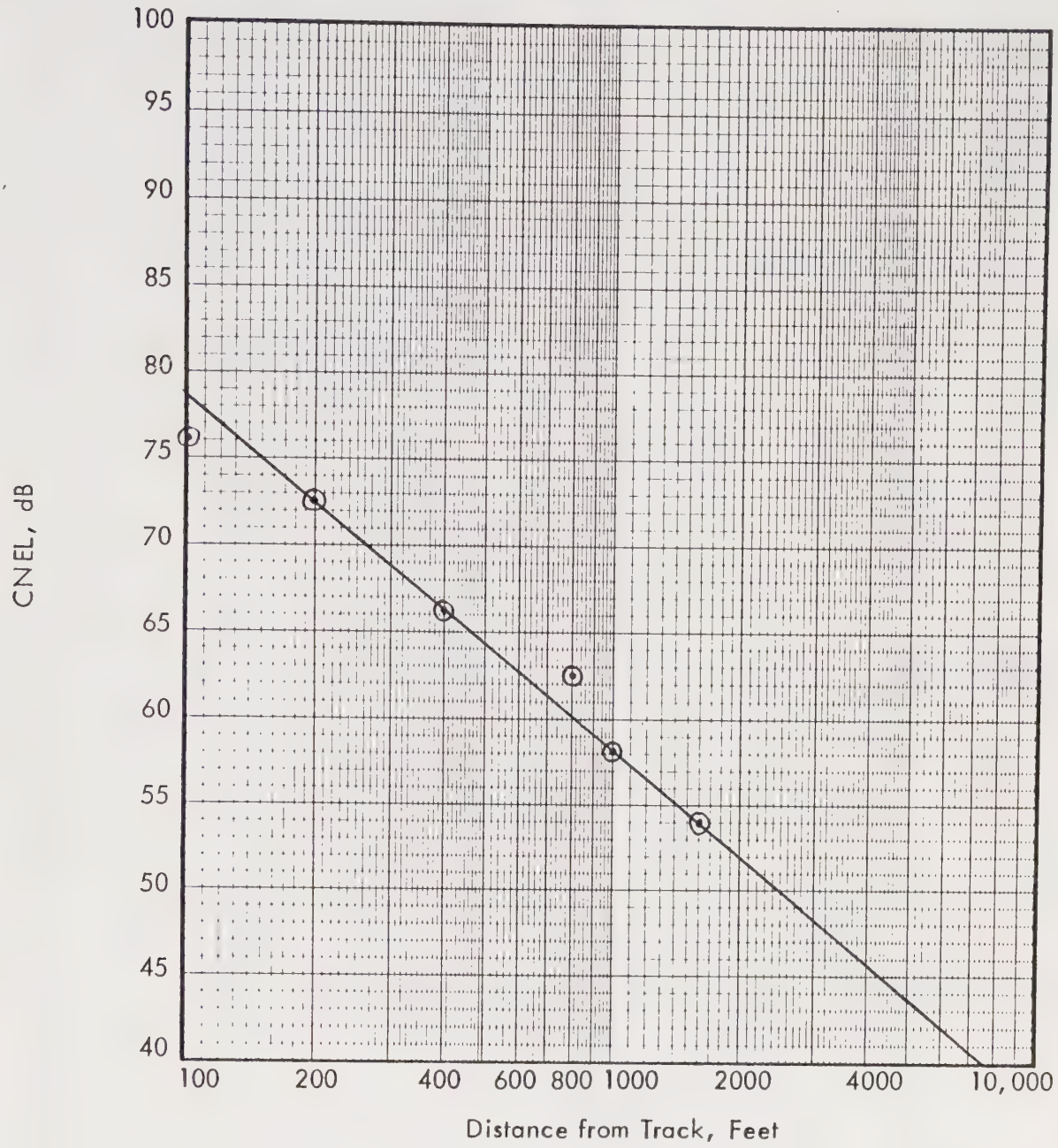
Train service over the next 10 years is not expected to increase, and service to the County will remain the same.

On the following pages are the worksheets used to determine CNEL contours and a graphic display of the contour locations.

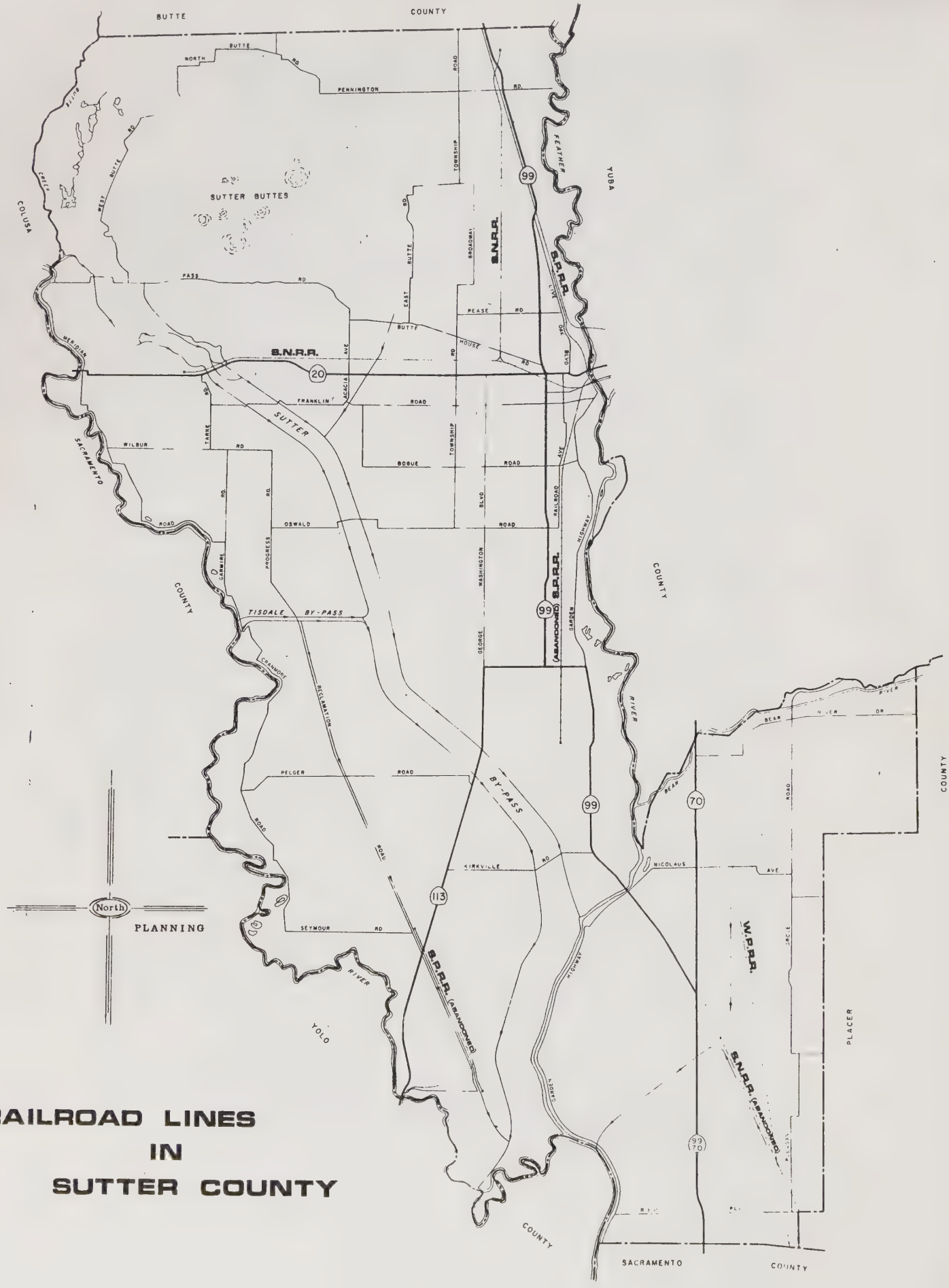
CNEL WORKSHEET FOR LINE OPERATIONS

Train Category Identification	L, feet (train length)	V, mph (train speed)	% grade	Barrier (if existing)	Distance to track, feet	(1) Pass-by Duration, sec	(2) C_2 $10\log_{10}$	(3) Car SPL at 100', dB C_1	(4) Car - distance attenuation	(5) β_{bc} Car barrier correction	(6) Car Noise Adjustment, C_3	(7) SENEL (cars), dB $C_1+C_2+C_3-\beta-\beta_{bc}$	(8) Loco. SENEL at 100', C_4, dB	(9) Loco. distance attenuation, β	(10) β_{be} Loco. Barrier correction	(11) Helper engine adjustment, C_5	(12) SENEL (Loco), dB $C_4-\beta-\beta_{be}$	(13) SENEL (Train) dB	(14) N equiv. no. of daily operations	(15) CNEL contribution	COMPOSITE CNEL AT DISTANCE INDICATED (16) 100'	(17) 200'	(18) 400'	(19) 800'	(20)	(21)
1 South. Pacific Mainline North & South	4500	55	0	0	100'	56	17.5	85	0			102.5	99	0		0	99	104.1	130	76						
					200'				4			98.5		3.5			95.5	100.2		72.5						
					400'				10.5			92		9			90	94.1		66						
					800'				16.5			86		14			85	88.5		62.5						
					1000				19			83.5		16			83	86.3		58						
					1600				21.5			81		19.5			79.5	82.4		54						
2					100'																					
					200'																					
					400'																					
					800'																					
3					100'																					
					200'																					
					400'																					
					800'																					
4					100'																					
					200'																					
					400'																					
					800'																					
5					100'																					
					200'																					
					400'																					
					800'																					
6					100'																					
					200'																					
					400'																					
					800'																					

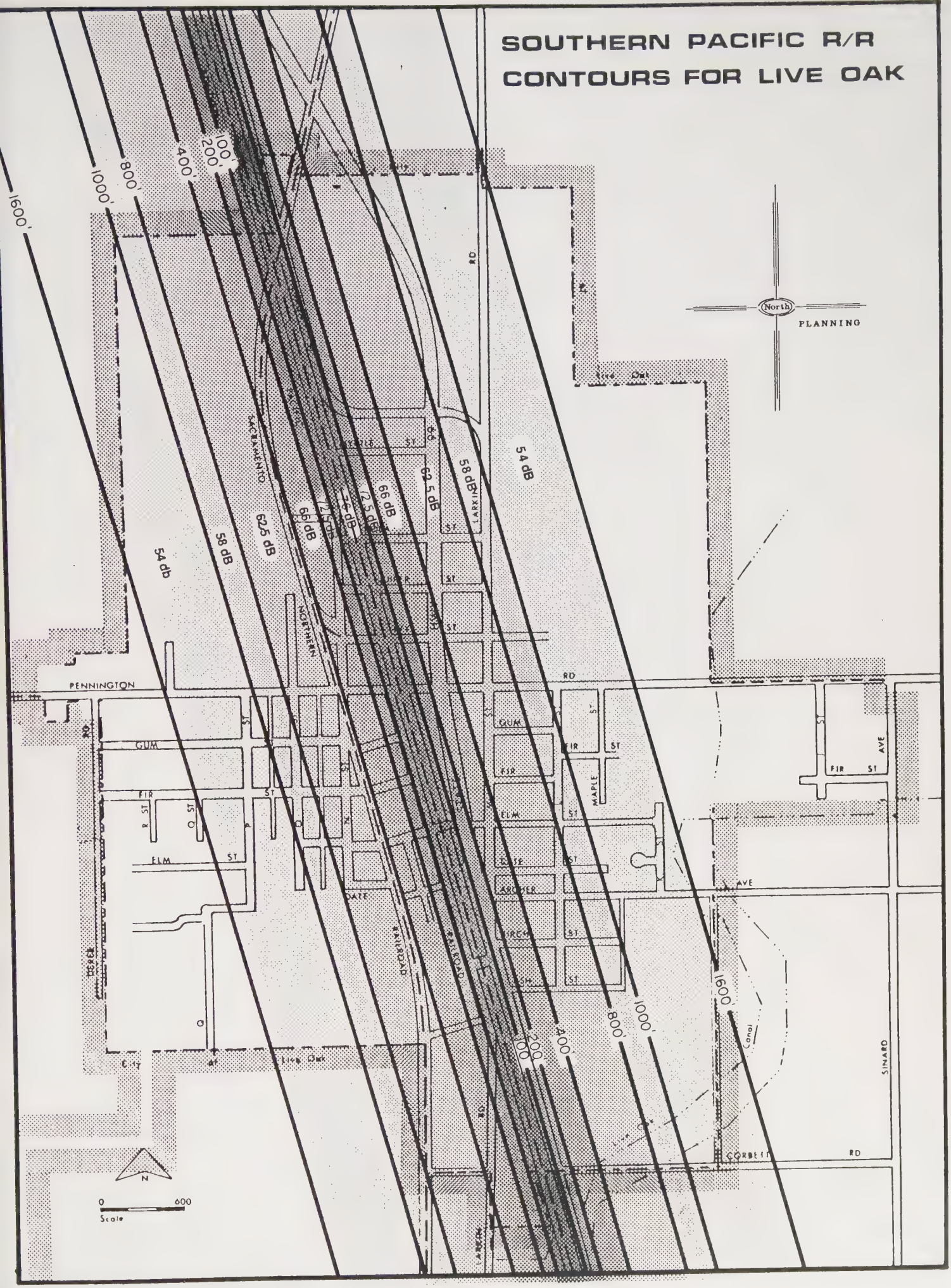
CNEL Worksheet for Line Operations

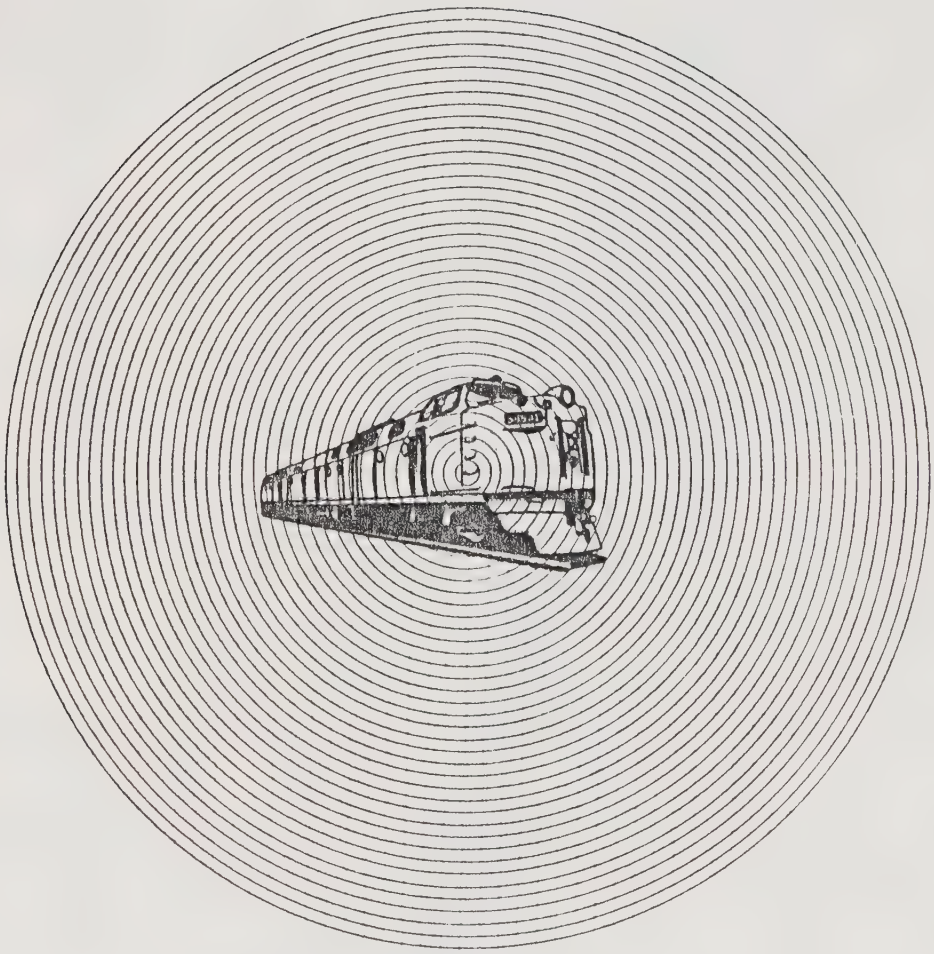


Form for Determination of CNEL Contour Locations via Graphical Interpolation.



RAILROAD LINES IN SUTTER COUNTY


SOUTHERN PACIFIC R/R
CONTOURS FOR LIVE OAK
1600'
1000'
800'
400'
200'
100'
54 dB
58 dB
62.5 dB
66 dB
72.5 dB
North
PLANNING
PENNINGTON RD
GUM
FIR ST
ELM ST
MAPLE
DATE
LARKIN
SACRAMENTO
NORTHERN
RAILROAD
SINARD
CORBETT RD
Live Oak
Canal
0
600
Scale



Sacramento Northern Railway and Yard

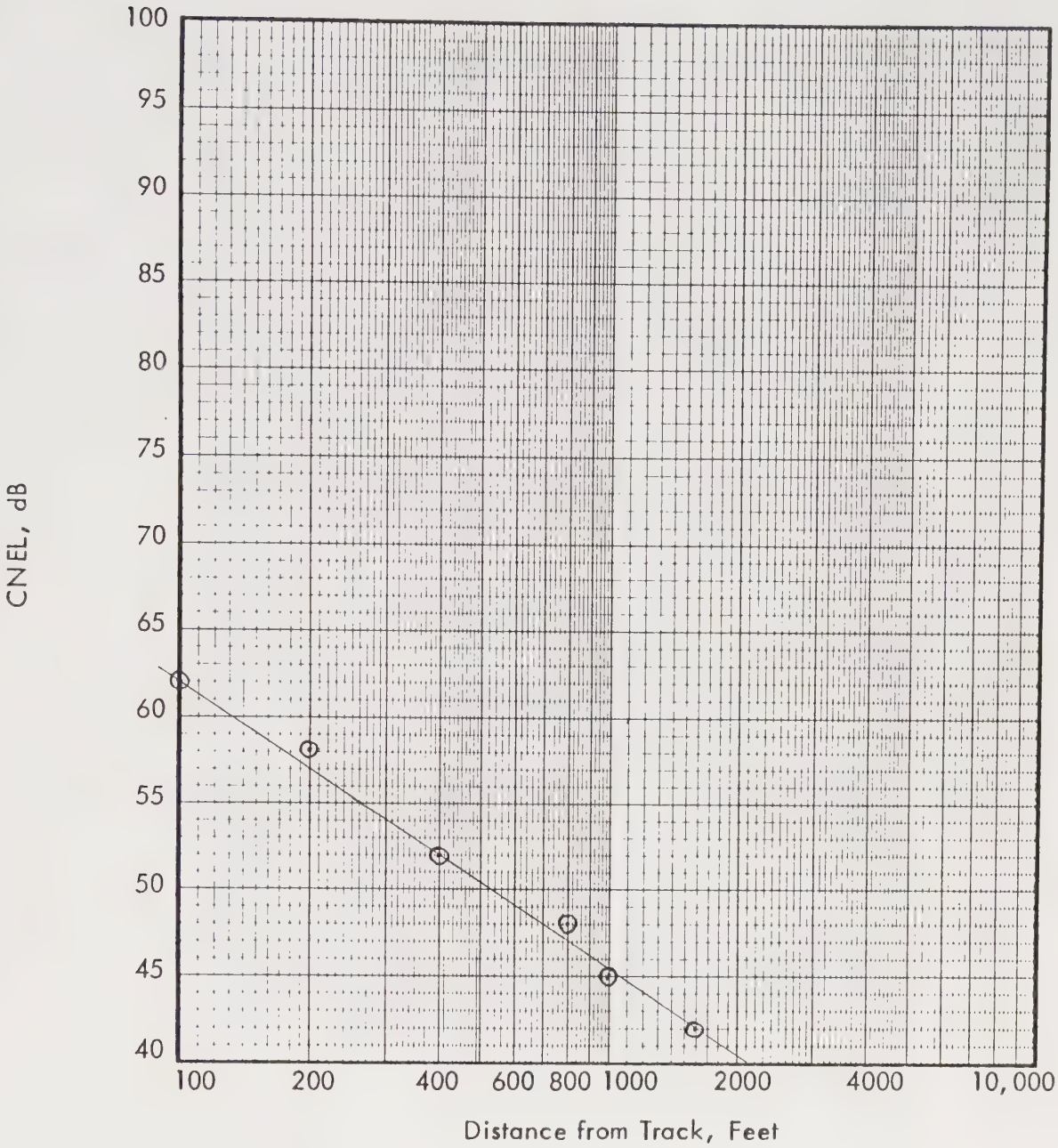
The schedule for the Sacramento Northern Railway in Sutter County varies with the seasons. From July of each year through October, two trains a day, 7 days a week leave the Yuba City yard for Live Oak. These trains are carrying the crops harvested in the County to and from the canneries. In the off season generally one train, 5 days a week is on the same track. The average length for these trains is 400 feet, with an average speed of 35 mph.

Yard operations also work with the seasons--car switching is done 24 hours, 7 days a week at peak and 5 days a week in the off season. Yard operations contours are shown on Map 26a of the Yuba City area.

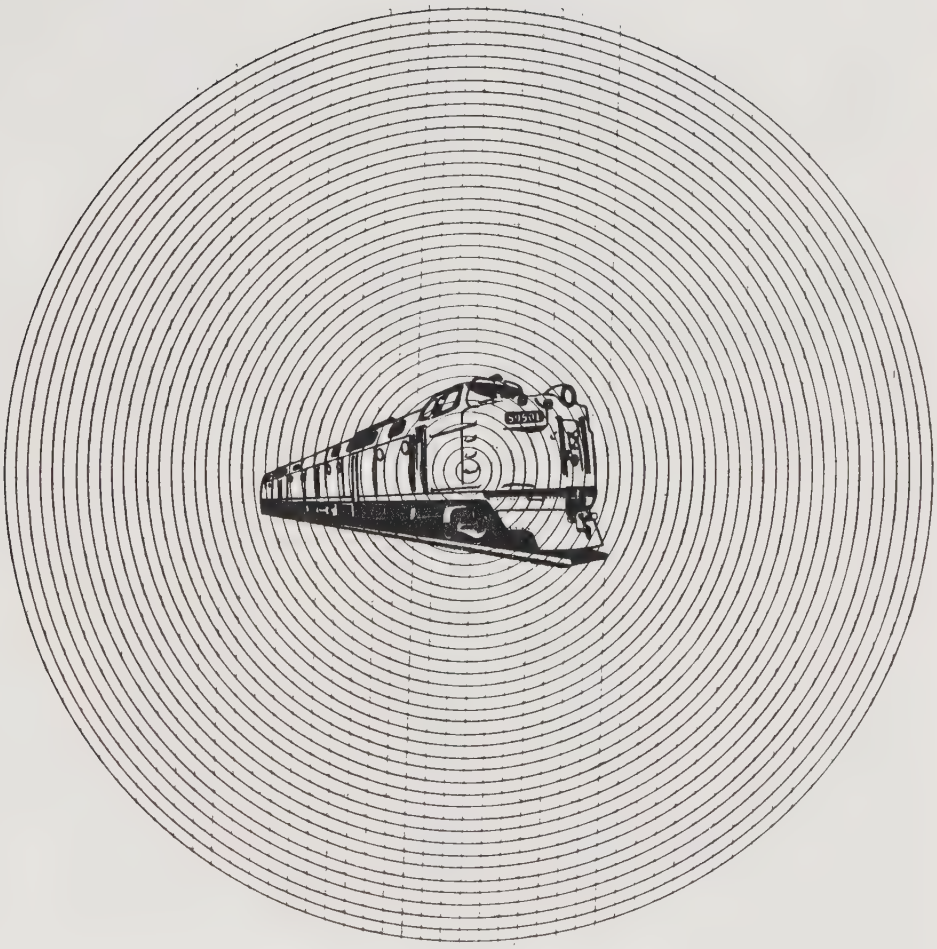
CNEL WORKSHEET FOR LINE OPERATIONS

Train Category Identification	L, feet (train length)	V, mph (train speed)	% grade	Barrier (if existing)	Distance to track, feet	(1) Pass-by Duration, sec $t = L/V$	(2) C_2 $10\log_{10}(t)$	(3) Car SPL at 100', dB C_1	(4) Car-distance attenuation σ	(5) σ_{bc}: Car barrier correction	(6) Car Noise Adjustment: C_3	(7) SENEL (cars), dB $C_1+C_2+C_3-\sigma-\sigma_{bc}$	(8) Loco. SENEL at 100'; C_4, dB	(9) Loco. distance attenuation: σ	(10) σ_{be} Loco. Barrier correction -	(11) Helper engine adjustment, C_5	(12) SENEL (loco.), dB $C_4+C_5-\sigma-\sigma_{be}$	(13) SENEL (Train) dB	(14) N equiv. no. of daily operations	(15) CNEL contribution	COMPOSITE CNEL AT DISTANCE INDICATED (16) 100'	(17) 200'	(18) 400'	(19) 800'	(20)	(21)
1 Sac. North. btw. Y.C and L.O	400	35	0	0	100'	11.4	10.5	81	0			91.5	101	0		0	101	101.5	11	62					
					200'				4			87.5		3.5			97.5	98		58					
					400'				10.5			81.5		9			92	92.3		52					
					800'				16.5			75		14			87	87.3		48					
					1000				19			72.5		16			85	85.2		45					
					1600				21.5			70		19.5			82.5	82.7		42					
2					100'																				
					200'																				
					400'																				
					800'																				
3					100'																				
					200'																				
					400'																				
					800'																				
4					100'																				
					200'																				
					400'																				
					800'																				
5					100'																				
					200'																				
					400'																				
					800'																				
6					100'																				
					200'																				
					400'																				
					800'																				

CNEL Worksheet for Line Operations



Form for Determination of CNEL Contour Locations via Graphical Interpolation.



Western Pacific Railroad

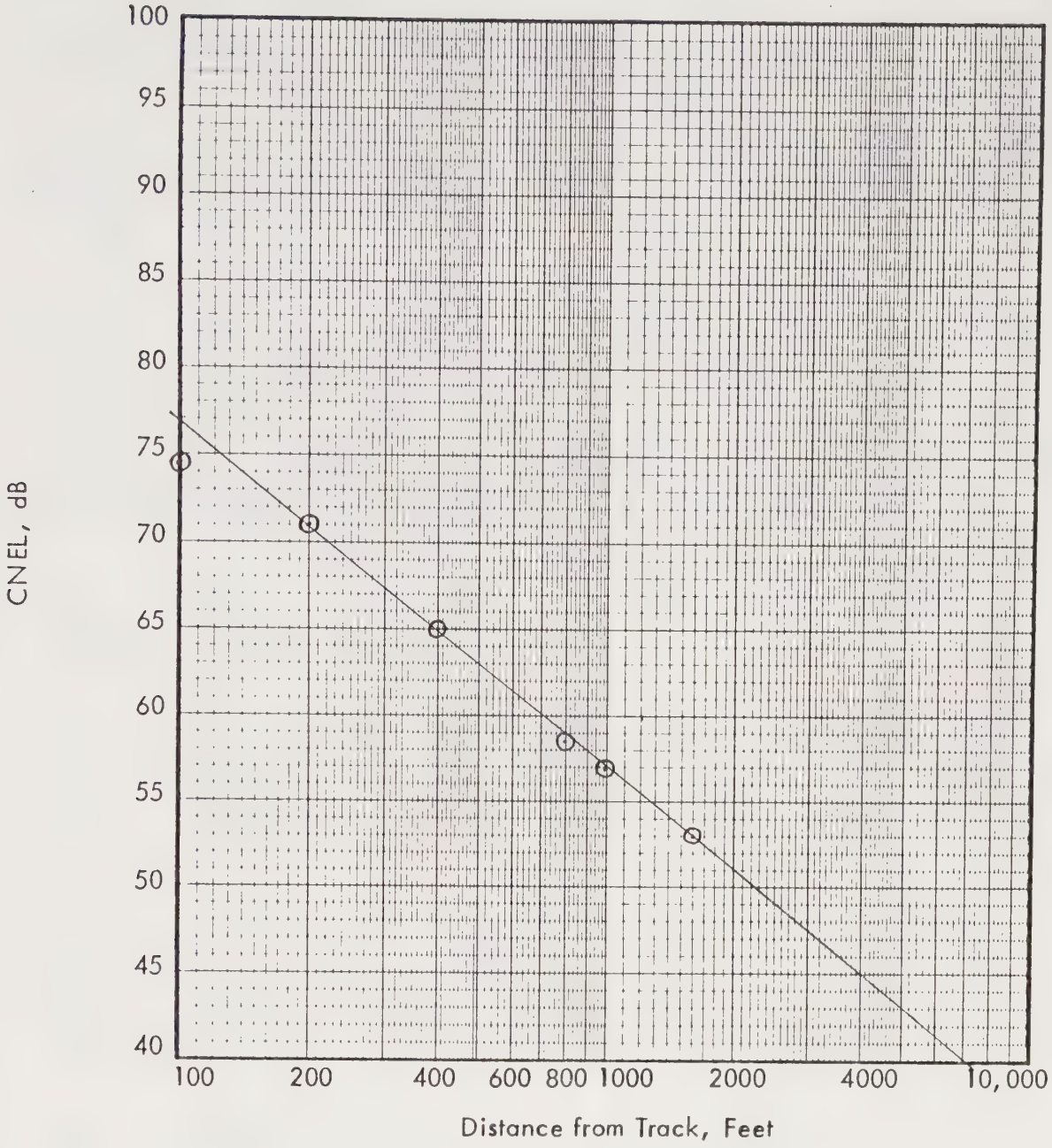
Western Pacific averages 14 trains on their main line track per day. Seven of these trains pass through during the day (7 a.m. to 10 p.m.) and seven trains at night (10 p.m. to 7 a.m.) Each of these trains averages 1 mile (5280 feet) in length and travels at a speed of 60 mph.

Along the entire main line route of the Western Pacific Railroad in the south Sutter area, there are approximately 595 people living within 800 feet of the track. These people are exposed to CNEL sound levels from 74.5 dB at 100 feet to 58.5 dB at 800 feet as shown on the Line Operations Worksheet on Page 28.

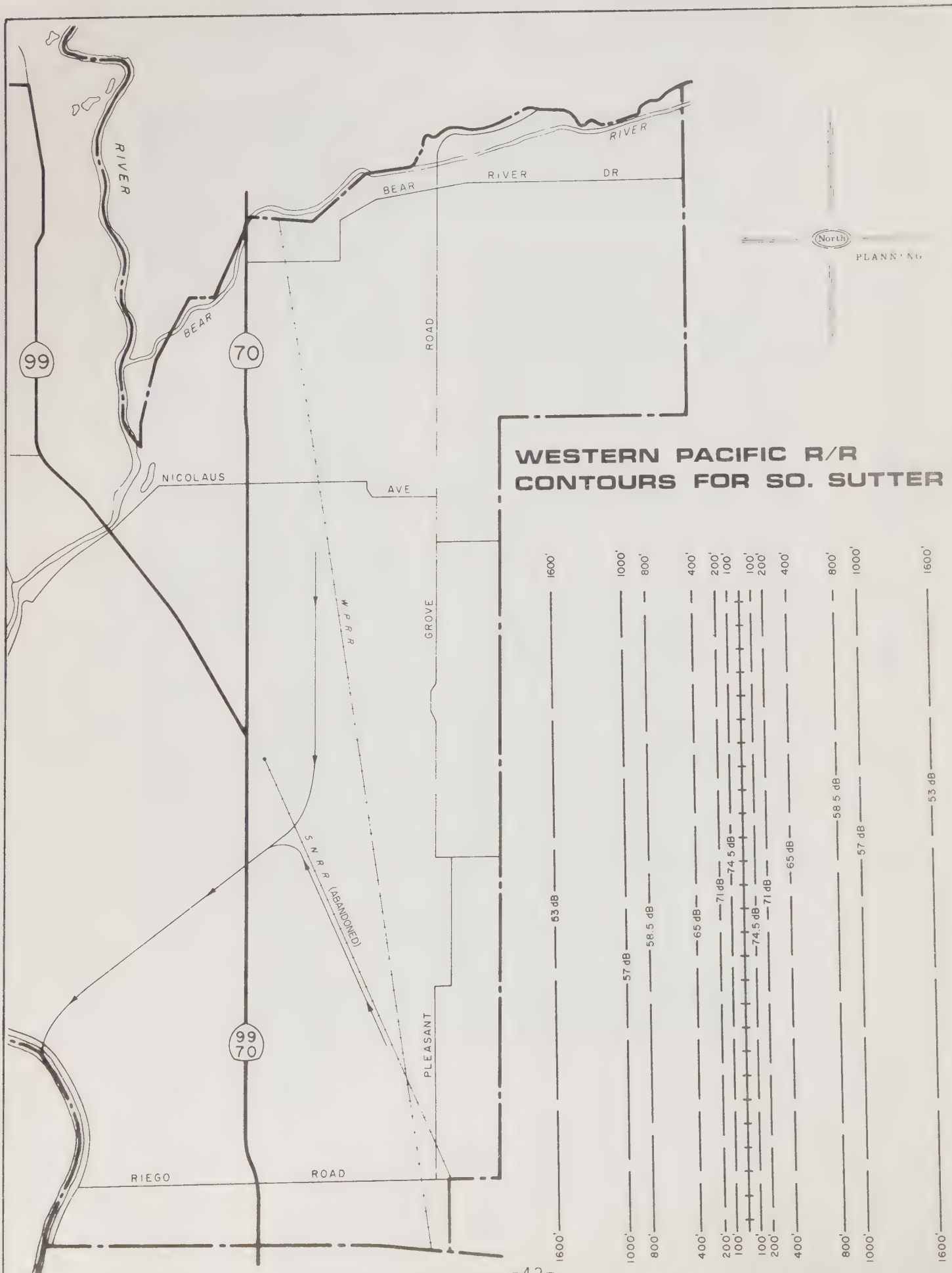
CNEL WORKSHEET FOR LINE OPERATIONS

Train Category Identification	L, feet (train length)	V, mph train speed	% grade	Barrier if existing	Distance to track, feet	1) Pass-by Duration, sec = L/V	2) C_2 $(10\log_{10}{}^{1})$	3) Car SPL at 100', dB C_1	4) Car - distance attenuation	5) $^{\prime}bc$ Car barrier correction	6) Car Noise Adjustment, C_3	7) SENEL cars), dB $C_1-C_2-C_3-{}^{\prime}bc$	8) Loco. SENEL at 100', dB C_4	9) Loco. distance attenuation	10) $^{\prime}be$ Loco. Barrier correction	11) Helper engine adjustment, C_5	12) SENEL loco.), dB $C_4-C_5-{}^{\prime}be$	13) SENEL (train) dB	14) N equiv no. of daily operations	15) CNEL contribution	COMPOSITE CNEL AT DISTANCE INDICATED					
																					16) 100'	17) 200'	18) 400'	19) 800'	20)	21)
1 Western Pacific MainLine Sutter Co.	5280	60	0	0	100'	60	19	86	0			105	99	0		0	99	106	77	74.5						
					200'				4			101		3.5			95.5	102.1		71						
					400'				10.5			94.5		9			90	96		65						
					800'				16.5			88.5		14			85	90		58.5						
					1000				19			86		16			83	88		57						
					1600				21.5			83.5		19.5			79.5	85		53						
2					100'																					
					200'																					
					400'																					
					800'																					
3					100'																					
					200'																					
					400'																					
					800'																					
4					100'																					
					200'																					
					400'																					
					800'																					
5					100'																					
					200'																					
					400'																					
					800'																					
6					100'																					
					200'																					
					400'																					
					800'																					

CNEL Worksheet for Line Operations



Form for Determination of CNEL Contour Locations via Graphical Interpolation.


RIVER
BEAR
RIVER
DR
BEAR
RIVER
ROAD
99
70
NICOLAUS
AVE
GROVE
W P R R
S N R R (ABANDONED)
PLEASANT
99
70
RIEGO
ROAD
North
PLANNING
WESTERN PACIFIC R/R
CONTOURS FOR SO. SUTTER
1600'
53 dB
1600'
1000'
57 dB
800'
58.5 dB
1000'
800'
400'
65 dB
400'
200'
71 dB
100'
74.5 dB
100'
200'
71 dB
400'
65 dB
800'
58.5 dB
1000'
57 dB
1600'
53 dB

AIRPORTS

Sutter County Airport

Sutter County Airport is a publicly owned basic utility stage-1 airport. The main business of the airport is crop dusting with Rainbow Aviation and Onstott Dusters based there.

Total operations for 1977 were 35,000--27,000 of these being local flights. All of these operations were propeller with approximately 15 percent being twin engines and 10 percent occuring at night.

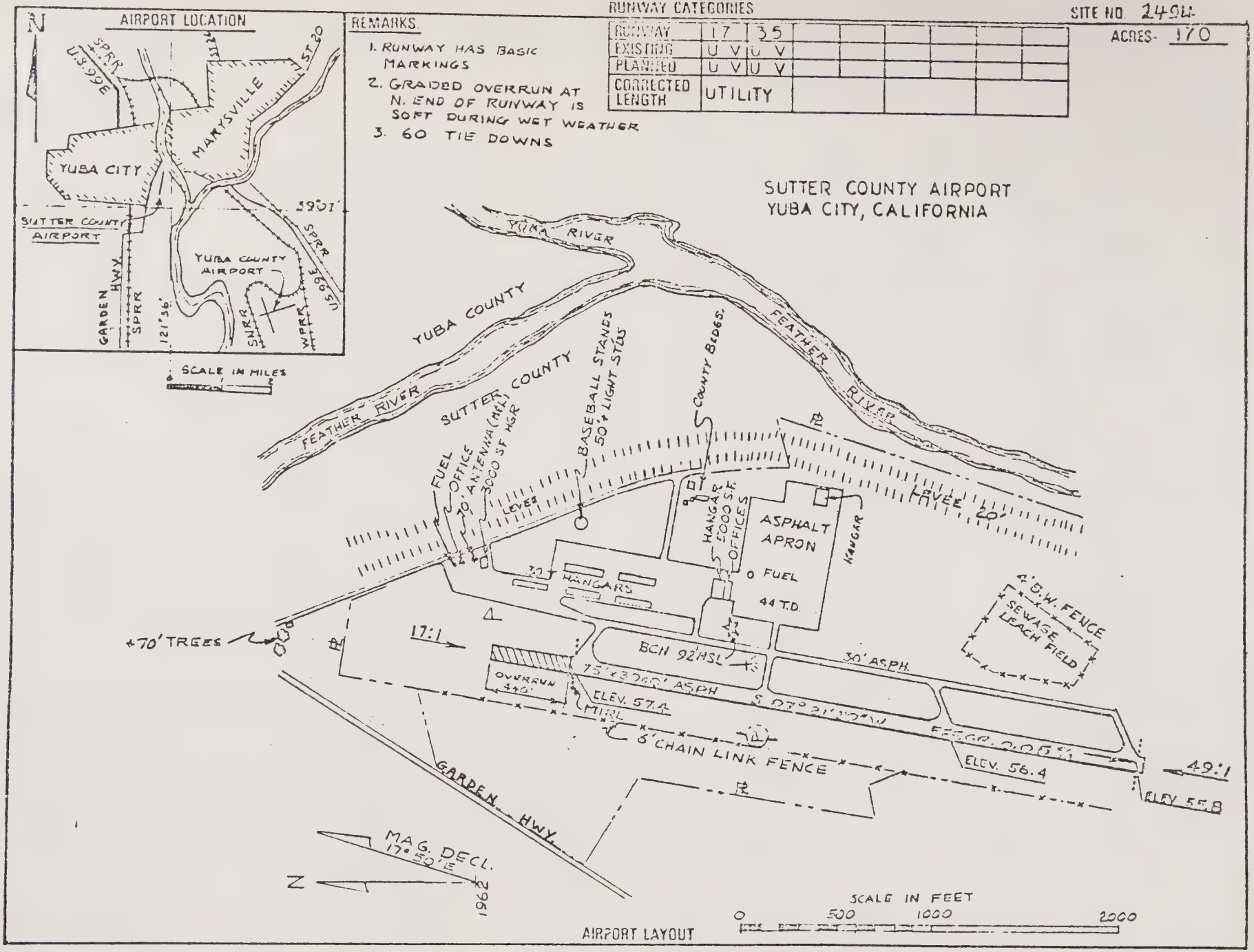
At present the runway length is 3,040 feet, however, the County is attempting to purchase additional property so that the runway could be extended by 1000 feet to a total length of just over 4000 feet. This improvement would elevate the classification of the airport to general utility. With the extended runway all types of single and twin engine propeller aircraft could use the airport. It is anticipated that operations would double by the year 2000 to approximately 70,000 annual operations--all of these still being propeller.

The runway utilization figures for both 1977 and 2000 show 90 percent in a southerly direction and 10 percent in a northerly direction for take-offs, due to predominantly southerly winds here in the Sacramento Valley.

At this time there are approximately 90 persons, all residents of the Sutter County Housing Authority, living in an area with L_{dn} contours of 60 dB. In the projected year of 1995, there will be 363 persons within 60 dB contours, and no one within 65 dB contours.

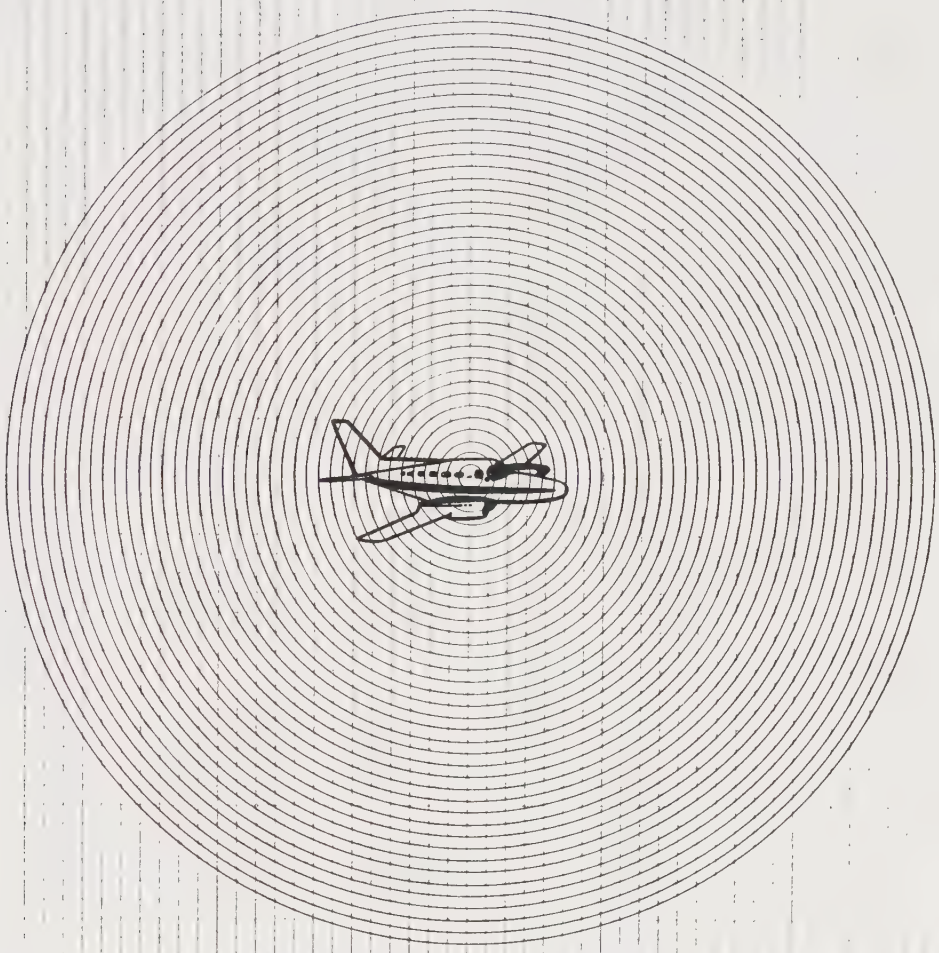
As mentioned earlier in the Noise Source section, south Sutter County is under the influence of Sacramento Metropolitan Airport due to constant fly over. In this part of the County is the Rio Ramaza mobilehome subdivision, which at present is in a 60+dB L_{dn} contour. In July of 1978 there were 240 residents in this community with the possibility of 318 persons living there when all vacant lots are filled in the future.

A location map and present and future noise contour chart for Sutter County Airport on the following pages.



YUBA CITY, CALIF- SUTTER CO.

AIRPORT CONTOUR ANALYSIS



AIRPORT OPERATIONS

Airport Name		Sutter County	Year - 1977
Runway Designation		17 / 35	
Runway Length		3,040 ft.	
Traffic Pattern (check one)		Left Hand ☐	Right Hand ☒
		Propeller	Jet
Number of Operations / Year		35,000	
Runway Utilization	Runway		
	17	90 %	%
	35	10 %	%
	Total	100 %	100 %
Percentage of Propeller or Jet Operations between 2200 and 0700		10 %	%
Twin Engine Operations as Percentage of all Propeller Operations		15 %	
Turbojet Operations as Percentage of all Jet Operations			%

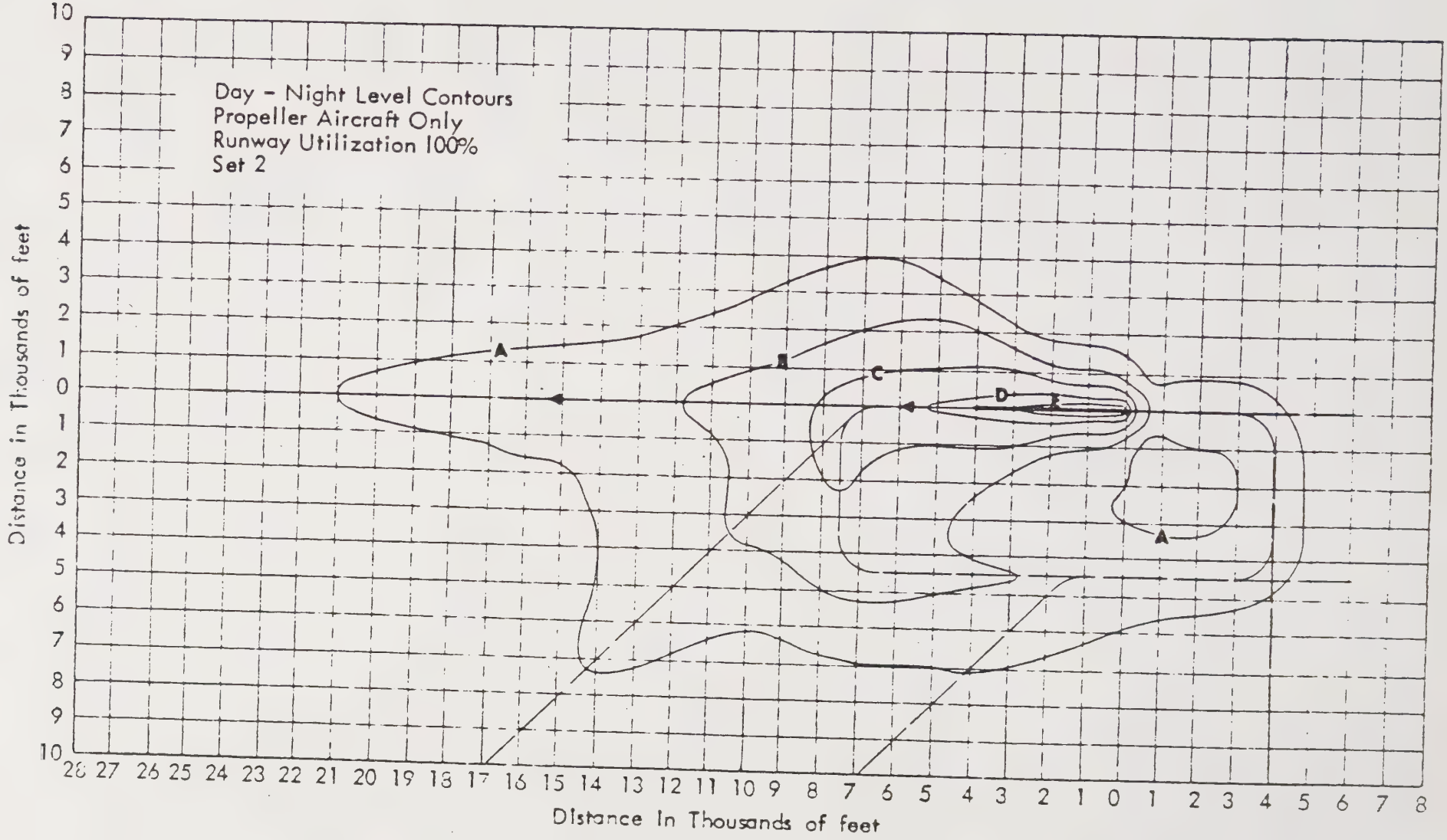
CONTOUR SECTION

Type of Operation (check one)	Propeller ☒	Jet ☐
Number of Operations / Year on this Runway (Propeller or Jet)		35,000 (1)
Percentage of Operations Between 2200 and 0700	10 %	
Adjustment Factor from Figure 6		1.9 (2)
If Propeller, Twin Engine Operations As Percentage of Propeller Operations	15 %	
Adjustment Factor from Figure 4		1.26 (3)
If Jet, Turbojet Operations as Percentage of Jet Operations	0 %	
Adjustment Factor from Figure 5		0 (3)
Adjustment for Larger Aircraft or Fleet Projections (Section VI - A, B)		0 (4)
Total Adjusted Operations (1) x (2) x (3) x (4)		83,790

From Tables 1-6 Find Contour Code

Turn to Contour Set	Circle One from each Set			From Contour Code Write Down Value of Contour Alongside Letter Code, Where Applicable
	NEF	(P)	(100)	1
	(LDN)	J	075	(2)
	CNR		050	3
				4
				5

A =
B =
C = 55
D = 60
E = 65


Day – Night Level Contours
Propeller Aircraft Only
Runway Utilization 100%
Set 2
A
B
C
D
E
A
Distance in Thousands of feet
Distance In Thousands of feet
10 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 10
28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8

LDN – P – 100 – 2

AIRPORT OPERATIONS

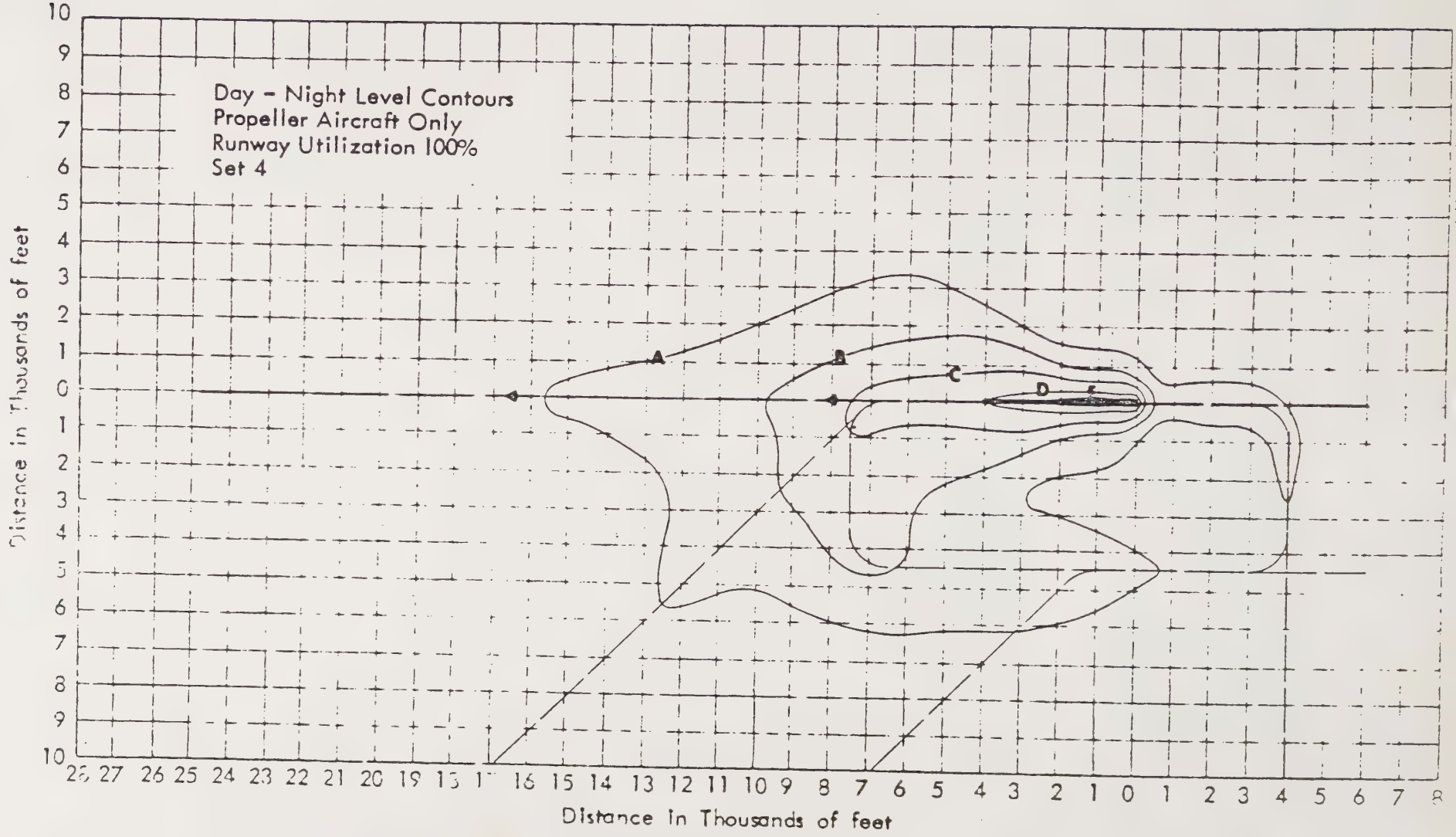
Airport Name Sutter County		Year - 1995	
Runway Designation		17 / 35	
Runway Length		4000+ ft.	
Traffic Pattern (check one)		Left Hand ☐	Right Hand ☒
		Propeller	Jet
Number of Operations / Year		70,000	
Runway Utilization	Runway		
	17	90 %	%
	35	10 %	%
	Total	100 %	100 %
Percentage of Propeller or Jet Operations between 2200 and 0700		10 %	%
Twin Engine Operations as Percentage of all Propeller Operations		15 %	
Turbojet Operations as Percentage of all Jet Operations			%

CONTOUR SELECTION

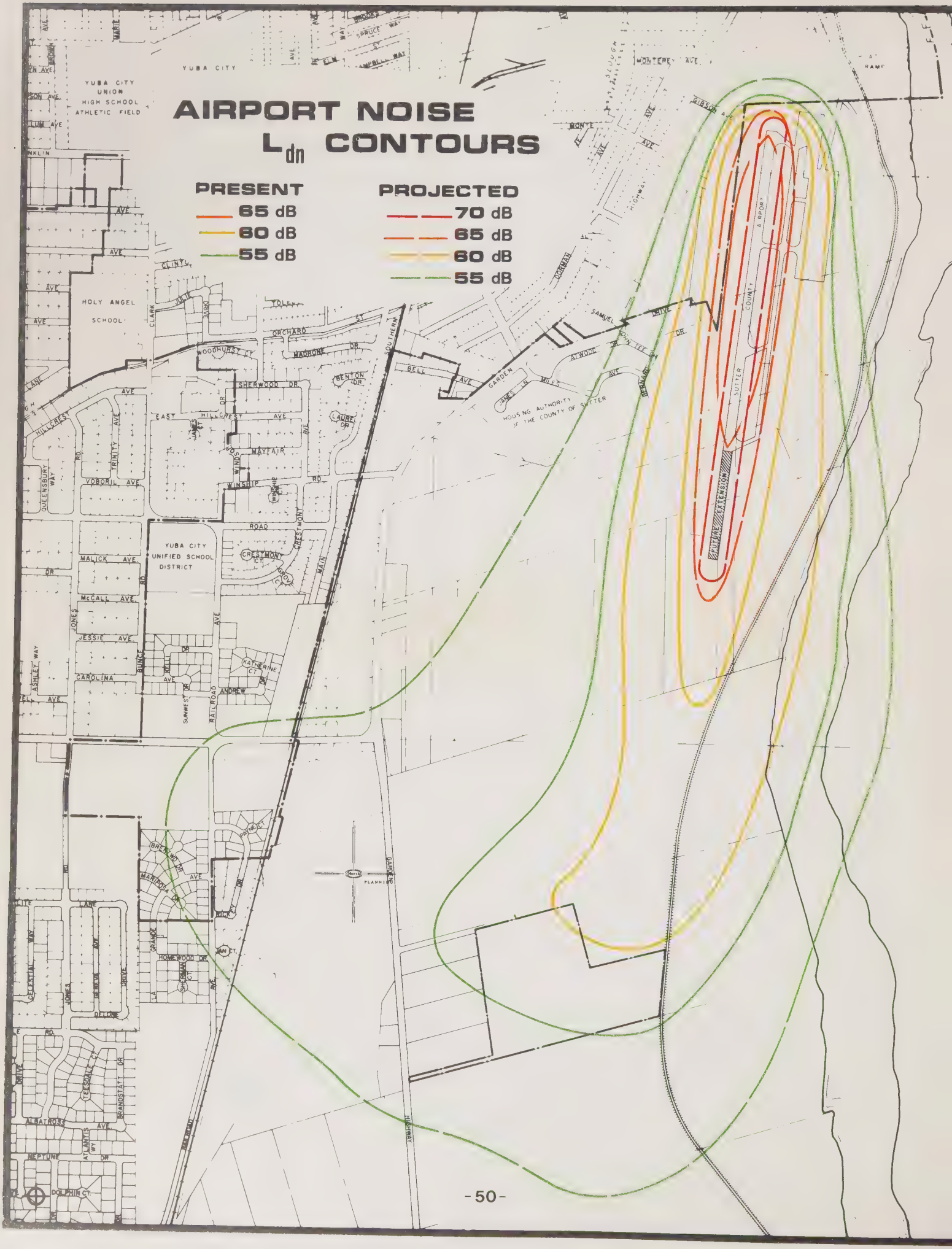
Type of Operation (check one)	Propeller ☒	Jet ☐
Number of Operations / Year on this Runway (Propeller or Jet)		70,000 (1)
Percentage of Operations Between 2200 and 0700	10 %	
Adjustment Factor from Figure 6		1.9 (2)
If Propeller, Twin Engine Operations As Percentage of Propeller Operations	15 %	
Adjustment Factor from Figure 4		1.26 (3)
If Jet, Turbojet Operations as Percentage of Jet Operations	0 %	
Adjustment Factor from Figure 5		0 (3)
Adjustment for Larger Aircraft or Float Projections (Section VI - A, B)		0 (4)
Total Adjusted Operations (1) x (2) x (3) x (4)		167,580

From Tables 1-6 Find Contour Code

Turn to Contour Set	Circle One from each Set			From Contour Code Write Down Value of Contour Alongside Letter Code, Where Applicable
	NEF (P)	(100)	1	A =
	(LDN) J	075	2	B = 55
	CNR	050	3	C = 60
			(4)	D = 65
			5	E = 70


Day - Night Level Contours
Propeller Aircraft Only
Runway Utilization 100%
Set 4
A
B
C
D
Distance in Thousands of feet
Distance In Thousands of feet

LDN - P - 100- 4


AIRPORT NOISE
L_{dn} CONTOURS
PRESENT
65 dB
60 dB
55 dB
PROJECTED
70 dB
65 dB
60 dB
55 dB
YUBA CITY
YUBA CITY UNION HIGH SCHOOL ATHLETIC FIELD
HOLY ANGEL SCHOOL
YUBA CITY UNIFIED SCHOOL DISTRICT
HOUSING AUTHORITY OF THE COUNTY OF SUTTER
FUTURE EXTENSION
SUTTER COUNTY AIRPORT
MONTEREY AVE.
SOUTHERN PACIFIC RAILROAD
HIGHWAY 99

STATIONARY NOISE

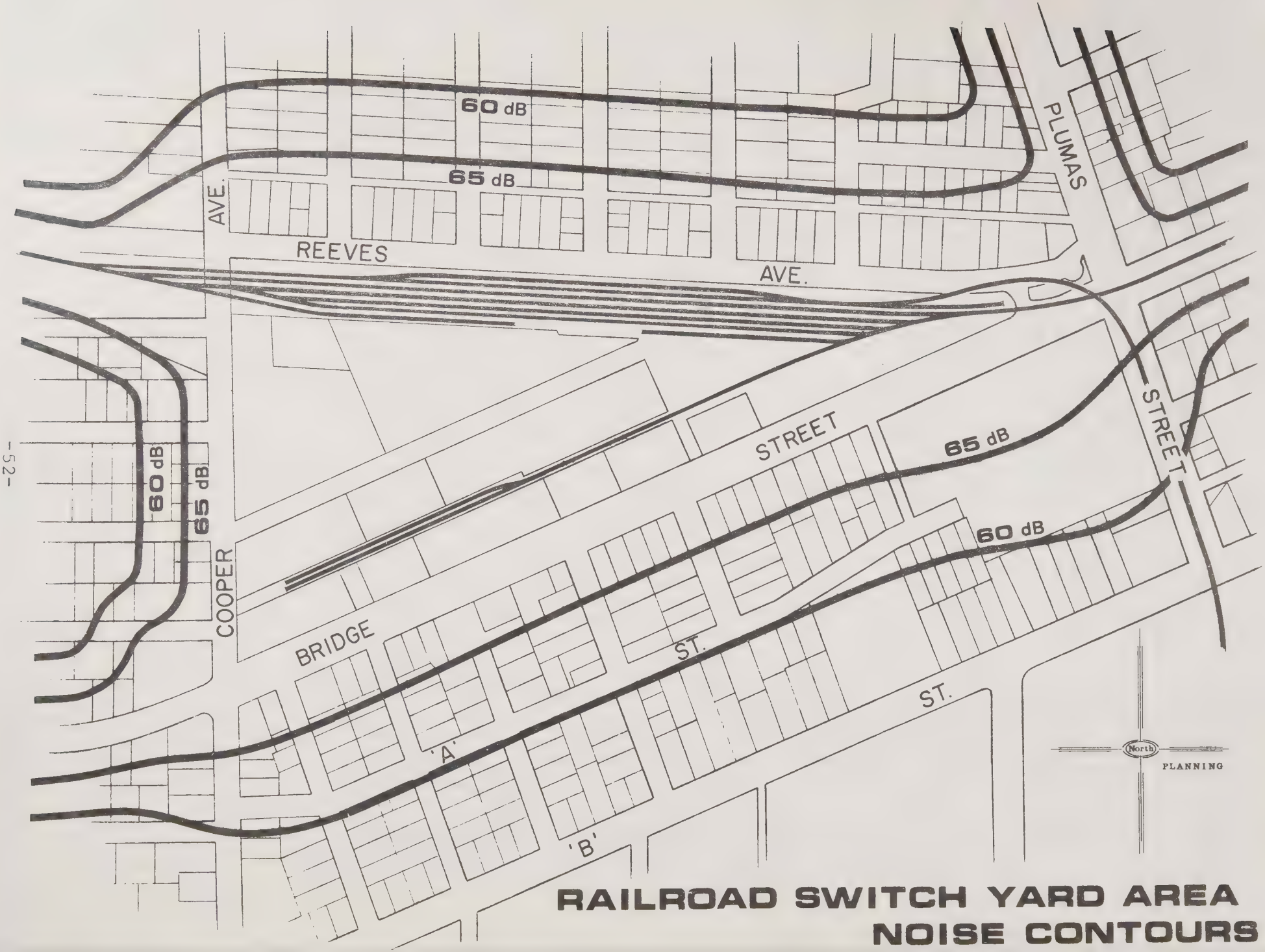
While transportation noise predominates in Sutter County, there is also a variety of other stationary noise sources. Most recognizable of these is the flat switcher yard operated by Sacramento Northern Railway southwest of the central business district in Yuba City. Though operating year round, it experiences peak activity during harvest (July through October) coinciding with dehydrator(fruit,nut) and cannery (tomatoes, peaches, prunes) seasonal peaks. The latter two lasting from six to eight weeks each year.

There are no major industrial plants in the County. However, there are a few steel fabrication firms, mobilehome manufacturers and molding mills. Generally, most of the industrial noise created is contained within the plant facility. The addition of other stationary sources of noise is quite possible with approximately 700 acres of industrial land still to be developed throughout the County.

Commercial areas with the array of businesses that make them up are also noise generators. Not only from the vehicles used in taking one to and from them, but the businesses themselves, such as a car wash, bar, service station or body shop.

The subdivisions in which we live also produce noises that bother us at one time or another, including televisions, stereos, power lawn mowers and air conditioning units. With constant building in the County, the locations where construction is taking place are quite noisy. Even though it may only be for a short period of time, electric saws, drills and hammering have been shown to be bothersome to nearby residents while they last.

The map on the following page illustrates the sound level contours for the major stationary noises and the transportation systems that service them. As presented on the map, the triangle formed by Bridge STreet, Cooper Avenue and Reeves Avenue averages 65 dB at its outside edge with higher readings occurring inside. There are 170 residents in this area; it is fully developed,and the figure should remain constant.Within the 60 dB contours, there are 375 residents. The contours will change if vehicular traffic increases on Bridge and Plumas Streets and railroad activity increases along Reeves Avenue, but this is expected to be only a moderate change in the future.



RAILROAD SWITCH YARD AREA NOISE CONTOURS

GLOSSARY

Acoustics - The science for the production, control, transmission, reception and effects of sound and of the phenomenon of hearing.

"A"Scale - The sound measuring scale that closely correlates with the loudness of sounds as perceived by the human ear. The unit of measure shall be dB(A). The "A" weighted scale covers a frequency range of 400 to 12,000 H_z.

Ambient Noise - All environmental noise which is usually a composite of sound from many sources near and far.

Ambient Noise Level - Calculated as an average noise level over a period of 15 minutes without inclusion of noise from isolated identifiable sources.

CNEL - Community Noise Equivalent Level - Places greater emphasis on measuring of night vs. day noise. A scale that takes into account all the A weighted acoustic energy received at a point, from all noise events causing levels of noise above a prescribed value.

CNR - Composite noise rating for airport environments often used by Department of Defense.

Decibel - A logarithmic scale applied to the description of sound levels.

Distance to Observer - Distance from centerline of highway to nearest point of measurement. (DE = DN DF; where DN and DF are distances from near and far lanes.

Fixed Point Noise Source - Any noise generator which is non-mobile in nature and creates noise in volume which may be in excess of acceptable standards as identified within this report.

Freeway - As differentiated from highways, freeways have controlled access. Access to and from other public roads is limited to specific locations.

Frequency - Characteristic of sound that is measured in cycles per second, or hertz; high frequency sounds are shrill and low frequency sounds are deep.

Hertz (H_z) - Unit of frequency, equivalent to 1 cycle per second.

L10dBA - A specific noise level that will be exceeded 10% of the time (i.e. L10 70 db(A) means the noise level will be greater than 70 decibels 10% of the measured time.

LDNdBA - A specific noise level that is exceeded during the day and night period. Day and night noise levels are differentiated.

Leq (Equivalent Energy Level) - Representative of the steady state sound level which, if played for a given length of time, would contain the same total of energy as the time varying signal.

Loudness - A measure of the subjective magnitude of a sound.

Net Noise Reduction - Decibel rating after barrier or attenuation computations are calculated.

Noise - Any unwanted sound that disturbs, harms or encroaches on the safety, health or well being of main and the environment.

Noise Contour - Lines of equal noise level.

Nomograph - A graph that enables one, by the aid of a straight-edge to read off the value of a dependent variable when the values of two or more independent variables are given.

Period - The smallest increment of time for which the function repeats itself.

Sound - Energy that is transmitted by longitudinal pressure waves in air or other material and is the objective cause of the sensation of hearing.

Sound Intensity - A measure of the loudness of sound.

Sound Level - A measure of the level of a sound with the A-weighting network in the measurement chain. If the A-weighting is used, the sound level is expressed in dB(A).

Sound Level Meter - An instrument for the measurement of noise and sound levels in accordance with an American standard.

Sound Pressure Level - The fundamental measure of sound levels using the decibel unit, defined as

$$SPL = 20 \log_{10} \frac{P}{P_o} \text{ dB}$$

where P_o is the refence pressure of 20 Pa.

Temporary Noise Sources - Those sources of noise generation which are of a fixed point nature and occur at infrequent intervals (trash collection, construction work, tree pruning, etc.)

Weighting Network - An electronic circuit which attempts to reproduce the frequency response characteristic of the human ear. The A-weighting network is often recommended.

Article 4. Noise Insulation Standards

1092. Noise Insulation Standards. Noise insulation standards shall be in accordance with the applicable requirements of California Administrative Code, Title 24, Part 6, Division T25, Chapter 1, Subchapter 1, Article 4, Section T25-1092, which reads as follows:

T25-1092. Noise Insulation Standards. (a) **Purpose.** The purpose of this article is to establish uniform minimum noise insulation performance standards to protect persons within new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings from the effects of excessive noise, including but not limited to hearing loss or impairment and persistent interference with speech and sleep.

(b) **Application and Scope.** The provisions of this article relating to noise insulation performance standards apply to new hotels, motels, apartment houses and dwellings other than detached single-family dwellings.

These regulations shall apply to all applications for building permits made subsequent to the effective date of these regulations.

These regulations shall become effective August 22, 1974.

(c) **Definitions.** The following special definitions shall apply to this article as applicable:

(1) **Impact Insulation Class (IIC)**—A single number rating for ceiling-floor construction that represents the ability of the construction to isolate impact noise, where measurement procedure is based on ASTM E492-73T and as defined in UBC Standard No. 35-2.

(2) **Sound Transmission Class (STC)**—A single figure rating for floor-ceiling and interior wall partition construction that represents the ability of the construction to isolate airborne noise, where measurement procedure is based on ASTM E90-70 or ASTM E366-71 and as defined in UBC Standard No. 35-1.

(3) **Detached Single-Family Dwelling**—Any single-family dwelling which is separated from adjacent property lines by 3 feet or more or is separated from adjacent buildings by 6 feet or more.

(d) **Sound Transmission Control Between Dwelling Units.**

(1) **Wall and Floor-Ceiling Assemblies.** Wall and floor-ceiling assemblies separating dwelling units or guest rooms from each other and from public space such as interior corridors and service areas shall provide airborne sound insulation for walls, and both airborne and impact sound insulation for floor-ceiling assemblies.

(2) **Airborne Sound Insulation.** All such separating walls and floor-ceiling assemblies shall provide an airborne sound insulation equal to that required to meet a Sound Transmission Class (STC) of 50 (45 if field tested) as defined in UBC Standard No. 35-1.

Penetrations or openings in construction assemblies for piping, electrical devices, recessed cabinets, bathtubs, soffits, or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings.

Dwelling unit entrance doors from interior corridors together with their perimeter seals shall have a Sound Transmission Class (STC) rating of not less than 30 and such perimeter seals shall be maintained in good operating condition.

(3) **Impact Sound Insulation.** All separating floor-ceiling assemblies between separate units or guest rooms shall provide impact sound insulation equal to that required to meet an Impact Insulation Class (IIC) of 50 (45 if field tested) as defined in UBC Standard No. 35-2. Floor coverings may be included in the assembly to obtain the required rating, and must be retained as a permanent part of the assembly and may only be replaced by other floor covering that provides the same sound insulation required above.

(4) **Tested Assemblies.** Field or laboratory tested wall or floor-ceiling designs having an STC or IIC of 50 or more as determined by UBC Standard 35-1, 35-2 or 35-3 may be used without any additional field testing when in the opinion of the Building Officials the laboratory tested design has not been compromised by flanking paths. Tests may be required by the Building Official when evidence of compromised separations is noted.

(5) **Field Testing.** Field testing, when required, shall be done under the supervision of a person experienced in the field of acoustical testing and engineering, who shall forward test results to the Building Official showing that the minimum sound insulation requirements stated above have been met.

(6) **Airborne Sound Insulation Field Tests.** When required, airborne sound insulation shall be determined according to the applicable Field Airborne Sound Transmission Loss Test procedures of U.B.C. Standard No. 35-3. All sound transmitted from the source room to the receiving room shall be considered to be transmitted through the test partition.

(7) **Impact Sound Insulation Field Test.** When required, impact sound insulation shall be determined in accordance with U.B.C. Standard No. 35-2.

Note: Excerpts from the 1973 U.B.C., Appendix Chapter 35, reproduced with permission of International Conference of Building Officials, 5360 S. Workman Mill Road, Whittier, California.

(e) **Noise Insulation from Exterior Sources.**

(1) **Location and Orientation.** Consistent with land use standards, residential structures located in noise critical areas, such as proximity to select system of county roads and city streets (as specified in 186.4 of the State of California Streets and Highways Code), railroads, rapid transit lines, airports, or industrial areas shall be designed to prevent the intrusion of exterior noises beyond prescribed levels with all exterior doors and windows in the closed position. Proper design shall include, but shall not be limited to, orientation of the residential structure, set-backs, shielding, and sound insulation of the building itself.

(2) **Interior Noise Levels.** Interior community noise equivalent levels (CNEL) with windows closed, attributable to exterior sources shall not exceed an annual CNEL of 45 dB in any habitable room.

(3) **Airport Noise Source.** Residential structures to be located within an annual CNEL contour (as defined in Title 4, Subchapter 6, California Administrative Code) of 60 require an acoustical analysis showing that the structure has been designed to limit intruding noise to the prescribed allowable levels. CNEL's shall be as determined by the local jurisdiction in accordance with its local general plan.

(4) **Vehicular and Industrial Noise Sources.** Residential buildings or structures to be located within annual exterior community noise equivalent level contours of 60 dB adjacent to the select system of county roads and city streets (as specified in Section 186.4 of the State of California Streets and Highways Code), freeways, state highways, railroads, rapid-transit lines and industrial noise sources shall require an acoustical analysis showing that the proposed building has been designed to limit intruding noise to the allowable interior noise levels prescribed in Section T25-1092(e)(2).

Exception: Railroads, where there are no nighttime (10:00 p.m. to 7:00 a.m.) railway operations and where daytime (7:00 a.m. to 10:00 p.m.) railway operations do not exceed four (4) per day.

(5) **Compliance.**

(A) Evidence of compliance shall consist of submittal of an acoustical analysis report, prepared under the supervision of a person experienced in the field of acoustical engineering, with the application for building permit. The report shall show topographical relationship of noise sources and dwelling site, identification of noise sources and their characteristics, predicted noise spectra at the exterior of the proposed dwelling structure considering present and future land usage, basis for the prediction (measured or obtained from published data), noise attenuation measures to be applied, and an analysis of the noise insulation effectiveness of the proposed construction showing that the prescribed interior noise level requirements are met. If interior allowable noise levels are met by requiring that windows be unopenable or closed, the design for the structure must also specify the means that will be employed to provide ventilation, and cooling if necessary, to provide a habitable interior environment.

(B) **Field Testing.** Only when inspection indicates that the construction is not in accordance with the approved design, field testing may be required. Interior noise measurements shall be taken under conditions of typical maximum exterior noise levels within legal limits. A test report showing compliance or noncompliance with prescribed interior allowable levels shall be submitted to the Building Official.

Where a complaint as to noncompliance with this article requires a field test to resolve the complaint, the complainant shall post a bond or adequate funds in escrow for the cost of said testing. Such costs shall be chargeable to the complainant when such field tests show that compliance with these regulations is in fact present. If such tests show noncompliance, then such testing costs shall be borne by the owner or builder.

NOTE: Authority cited for Article 4 (Section 1092): Sections 17910 through 17995, 18900 through 18915, 19870 through 19877 and 37039, Health and Safety Code.

History: 1. Amendment of subsection T25-1092 (b), repealer of subsection T25-1092 (f) and new subsection T25-1092 (e) (5) filed 4-11-75 as procedural and organizational; effective upon filing (Register 75, No. 15). For prior history, see Register 74, No. 51.

FACTORS CONSIDERED IN EACH OF FOUR METHODS
FOR DESCRIBING THE INTRUSIVENESS
OF NOISE ON THE COMMUNITY

FACTOR	COMPOSITE NOISE RATING	NOISE EXPOSURE FORECAST	DAY/NIGHT AVERAGE SOUND LEVEL	COMMUNITY NOISE EQUIVALENT LEVEL
Basic Measure	Maximum Perceived Noise Level	Tone Corrected Perceived Noise Level	A Weighted Noise Level	A Weighted Noise Level
Measure of Duration of Individual Single Event	None	Energy Integration	Energy Integration	Energy Integration
	day 7 a.m. - 10 p.m. night 10 p.m. - 7 a.m.			day 7 a.m. - 7 p.m. evening 7p.m.-10p.m. night 10p.m.-7a.m.
Weighting for Time Period	Day 0 dB Night 12 dB		Day 0 dB Night 10 dB	Day 0 dB Evening 5 dB Night 10 dB
Number (N) of Indentical Events in Time Period	10 Log N		10 Log N	
Summation of Contributions	Logarithmic		Logarithmic	

SOURCE: Environmental Noise Control Conference held November 11 and 12, 1975
University of California/Berkeley.

SUMMARY OF NOISE LEVELS IDENTIFIED AS REQUISITE
TO PROTECT PUBLIC HEALTH AND WELFARE
WITH AN ADEQUATE MARGIN OF SAFETY

EFFECT	LEVEL	AREA
Hearing Loss	$L_{eq(24)} \leq 70$ dB	All areas
Outdoor activity interference & annoyance	L_{dn} 55≤dB	Outdoors in residential areas & farms and other outdoor areas where people spend widely varying amounts of time & other places in which quiet is a basis for use.
	$L_{eq(24)} \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference & annoyance	L_{dn} 45≤dB	Indoor residential areas
	$L_{eq(24)} \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

SOURCE: Environmental Noise Control Conference held November 11 and 12, 1975, University of California/Berkeley.

INDOOR LOWER AND UPPER CRITERION LIMITS
FOR
SINGLE-FAMILY RESIDENTIAL DWELLINGS

Activity Sensitivity Group	Lower Limit, dB	Upper Limit dB
Group 1	30	60
Group 2	35	75
Group 3	45	75
Overall Residential Daytime	40	74
Overall Residential Nighttime	32	67

Group 1: Sleeping, working, leisure with concentration required. These activities are the ones most highly disturbed by noise.

Group 2: TV viewing, leisure with conversation required, home and family with conversation required, and eating. These activities are not as easily disturbed by noise as those in Group 1.

Group 3: Home and family with higher background noise level allowed. These activities produce noise themselves.

SOURCE: Environmental Noise Control Conference held November 11 and 12, 1975, University of California/Berkeley.

SOURCE OF PAGES 62-66: Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March, 1974 - U.S. Environmental Protection Agency (550/9-74-004)

Section 4

IDENTIFIED LEVELS OF ENVIRONMENTAL NOISE IN DEFINED AREAS

IDENTIFIED LEVELS

Table 4 identifies the levels requisite to protect public health and welfare with an adequate margin of safety for both activity interference and hearing loss. The table classifies the various areas according to the primary activities that are most likely to occur in each. The following is a brief description of each classification and a discussion of the basis for the identified levels in Table 4. For a more detailed discussion of hearing loss and activity interference, see Appendices C and D.

1. Residential areas are areas where human beings live, including apartments, seasonal residences, and mobile homes, as well as year-round residences. A quiet environment is necessary in both urban and rural residential areas in order to prevent activity interference and annoyance, and to permit the hearing mechanism to recuperate if it is exposed to higher levels of noise during other periods of the day.

An indoor L_{dn} of 45 dB will permit speech communication in the home, while an outdoor L_{dn} not exceeding 55 dB will permit normal speech communication at approximately three meters. Maintenance of this identified outdoor level will provide an indoor L_{dn} of approximately 40 dB with windows partly open for ventilation. The nighttime portion of this L_{dn} will be approximately 32 dB, which should in most cases, protect against sleep interference. An $L_{eq(24)}$ of 70 dB is identified as protecting against damage to hearing.

Although there is a separate category for commercial areas, commercial living accommodations such as hotels, motels, cottages, and inns should be included in the residential category since these are places where people sleep and sometimes spend extended periods of time.

2. Commercial areas include retail and financial service facilities, offices, and miscellaneous commercial services. They do not include warehouses, manufacturing plants, and other industrial facilities, which are included in the industrial classification. Although a level for activity interference has not been identified here (see footnote a), suggestions for such levels will be found in Table D-10 of Appendix D. On the other hand, a level of $L_{eq(24)}$ of 70 dB has been identified to protect against hearing loss.

YEARLY AVERAGE* EQUIVALENT SOUND LEVELS IDENTIFIED AS REQUISITE TO PROTECT THE PUBLIC HEALTH AND WELFARE WITH AN ADEQUATE MARGIN OF SAFETY

	Measure	Indoor			Outdoor		
		Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects (b)	Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects (b)
Residential with Outside Space and Farm Residences	L_{dn}	45		45	55		55
	$L_{eq(24)}$		70			70	
Residential with No Outside Space	L_{dn}	45		45			
	$L_{eq(24)}$		70				
Commercial	$L_{eq(24)}$	(a)	70	70(c)	(a)	70	70(c)
Inside Transportation	$L_{eq(24)}$	(a)	70	(a)			
Industrial	$L_{eq(24)(d)}$	(a)	70	70(c)	(a)	70	70(c)
Hospitals	L_{dn}	45		45	55		55
	$L_{eq(24)}$		70			70	
Educational	$L_{eq(24)}$	45		45	55		55
	$L_{eq(24)(d)}$		70			70	
Recreational Areas	$L_{eq(24)}$	(a)	70	70(c)	(a)	70	70(c)
Farm Land and General Unpopulated Land	$L_{eq(24)}$				(a)	70	70(c)

Code:

a. Since different types of activities appear to be associated with different levels, identification of a maximum level for activity interference may be difficult except in those circumstances where speech communication is a critical activity. (See Figure D-2 for noise levels as a function of distance which allow satisfactory communication.)
b. Based on lowest level.
c. Based only on hearing loss.
d. An $L_{eq(8)}$ of 75 dB may be identified in these situations so long as the exposure over the remaining 16 hours per day is low enough to result in a negligible contribution to the 24-hour average, i.e., no greater than an L_{eq} of 60 dB.

Note: Explanation of identified level for hearing loss: The exposure period which results in hearing loss at the identified level is a period of 40 years.

*Refers to energy rather than arithmetic averages.

3. Transportation facilities are included so as to protect individuals using public and private transportation. Included within this classification are commercial and private transportation vehicles. Identification of a level to protect against hearing loss is the only criterion used at this time, although levels lower than an L_{eq} of 70 dB are often desirable for effective speech communication. However, because of the great variety of conditions inside transportation vehicles, and because of the desirability of speech privacy in certain situations, a level based on activity interference cannot be identified for all modes of transportation at this time.

4. Industrial areas include such facilities as manufacturing plants, warehouses, storage areas, distribution facilities, and mining operations. Only a level for hearing loss is identified due to the lack of data with respect to annoyance and activity interference. Where the noise exposure is intermittent, an $L_{eq(24)}$ of 70 dB is identified as the maximum level for protection of hearing from industrial exposure to intermittent noise. For 8-hour exposures, an $L_{eq(8)}$ of 75 dB is considered appropriate so long as the exposure over the remaining 16 hours per day is low enough to result in a negligible contribution to the 24-hour average.

5. Hospital areas include the immediate neighborhood of the hospital as well as its interior. A quiet environment is required in hospital areas because of the importance of sleep and adequate rest to the recovery of patients. The maintenance of a noise level not exceeding an L_{dn} of 45 dB in the indoor hospital environment is deemed adequate to prevent activity interference and annoyance. An outdoor L_{dn} of 55 dB should be adequate to protect patients who spend some time outside, as well as insuring an adequately protective indoor level. An $L_{eq(24)}$ of 70 dB is identified to prevent hearing loss.

6. Educational areas include classrooms, auditoriums, schools in general, and those grounds not used for athletics. The principal consideration in the education environment is the prevention of interference with activities, particularly speech communication. An indoor noise level not exceeding $L_{eq(24)}$ of 45 dB is identified as adequate to facilitate thought and communication. Since teaching is occasionally conducted outside the classroom, an outdoor $L_{eq(24)}$ of 55 dB is identified as the maximum level to prevent activity interference. To protect against hearing loss an $L_{eq(24)}$ of 70 dB is identified for both indoor and outdoor environments. As in the industrial situation, eight hours is generally the amount of time spent in educational facilities. Therefore an $L_{eq(8)}$ of 75 dB is considered appropriate to protect against hearing loss, so long as the exposure over the remaining 16 hours is low enough to result in a negligible contribution to the 24-hour average.

7. Recreational areas include facilities where noise exposure is voluntary. Included within this classification are nightclubs, theaters, stadiums, racetracks, beaches, amusement parks, and athletic fields. Since sound exposure in such areas is usually voluntary, there is seldom any interference with the desired activity. Consequently, the chief consideration is

the protection of hearing. An $L_{eq(24)}$ of 70 dB is therefore identified for intermittent noise in order to prevent hearing damage.

8. Farm and general unpopulated land primarily includes agricultural property used for the production of crops or livestock. For such areas, the primary considerations are the protection of human hearing and the prevention of adverse effects on domestic and wild animals. Protection of hearing requires that an individual's exposure to intermittent noise does not exceed $L_{eq(24)}$ of 70 dB. A separate level for the exposure of animals is not identified due to the lack of data indicating that hearing damage risk for animals is substantially different from that of humans. The unpopulated areas include wilderness areas, parks, game refuges, and other areas that are set aside to provide enjoyment of the outdoors. Although quiet is not always of paramount importance in such areas, many individuals enjoy the special qualities of serenity and tranquility found in natural areas. At this time it is not possible to identify an appropriate level to prevent activity interference and annoyance. However, when it becomes possible to set such a level, a clear distinction should be made between natural and man-made noise.

USE OF IDENTIFIED ENVIRONMENTAL NOISE LEVELS

One of the purposes of this document is to provide a basis for judgment by states and local governments as a basis for setting standards. In doing so the information contained in this document must be utilized along with other relevant factors. These factors include the balance between costs and benefits associated with setting standards at particular noise levels, the nature of the existing or projected noise problems in any particular area, the local aspirations and the means available to control environmental noise.

In order to bring these factors together, states, local governments and the public will need to evaluate in a systematic manner the following:

1. The magnitude of existing or projected noise environments in defined areas as compared with the various levels identified in this document.

2. The community expectations for noise abatement with respect to existing or projected conditions.

3. The affected elements of the public and the degree of impact of present or projected environmental noise levels.

4. The noise sources, not controlled by Federal regulations, that cause local noise problems.

5. Methods available to attack environmental noise problems (use limitations, source control through noise emission standards, compatible land use planning, etc.).

6. The costs inherent in reducing noise to certain levels and benefits achieved by doing so.

7. The availability of technology to achieve the desired noise reduction.

The levels of environmental noise identified in this report provide the basis for assessing the effectiveness of any noise abatement program. These noise levels are identified irrespective of the nature of any individual noise source. One of the primary purposes of identifying environmental noise levels is to provide a basis by which noise source emission regulations, human exposure standards, land use planning, zoning, and building codes may be assessed, as to the degree with which they protect the public health and welfare with respect to noise. Such regulatory action must consider technical feasibility and economic reasonableness, the scale of time over which results can be expected, and the specific problems of enforcement. In the process of balancing these conflicting elements, the public health and welfare consequence of any specific decision can be determined by comparing the resultant noise environment against the environmental noise levels identified in this report.

Soundproofing of the Home

	CNEL	COST (1970 Dollars)
Stage One	65 dB	$3,200
Stage Two	65 - 70 dB	$4,820
Stage Three	70 - 80 dB	$12,550

The low density residence (6 units/acre) unit soundproofing costs for CNEL 70 to 80 will be the average of Stage Two and Stage Three costs of $8,685.

Source: Report by Wyle Laboratories in Sacramento Metropolitan Airport, Review, Comments and Responses on the Draft Environmental Impact Report Addendum.

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ACKNOWLEDGEMENTS

1. 1975 County Special Census, Sutter County, SRAPC

2. Sutter/Yuba County Chamber of Commerce

3. Yuba City Public Works Department

4. Sutter County Department of Public Works

5. Jim Standlee, CALTRANS, Traffic Census, Marysville, CA, District 03

6. J. M. Ivanusich, Sacramento Assistant Division Engineer, Southern Pacific Transportation Company

7. Roger Poitras, Agent for Sacramento Northern Railway, Yuba City, CA.

8. Milt Skaggs, Director of Sutter County Airport

9. Janet Ruggiero - Yolo County Planning Department

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